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Ala Pro Arg Gln Glu Asp Leu Val Pro Cys Ala Ser Leu Asp His Tyr  
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Ser Arg Leu Gly Trp Arg Leu Asp Leu Pro Trp Ser Gly Arg Ser Gly  
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Leu Thr Arg Ser Pro Ala Pro Gly Leu Cys Pro Ile Tyr Lys Pro Pro  
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Glu Thr Arg Pro Ala Lys Trp Asn Arg Thr Val Arg Thr Cys Cys Pro  
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Gly Trp Gly Gly Ala His Cys Thr Glu Ala Leu Ala Lys Ala Ser Pro  
100 105 110  
Glu Gly His Cys Phe Ala Met Trp Gln Cys Gln Leu Gln Ala Gly Ser  
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Ala Asn Ala Ser Ala Gly Ser Leu Glu Glu Cys Cys Ala Arg Pro Trp  
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Gly Arg Ser Trp Trp Asp Gly Ser Ser Gln Ala Cys Arg Ser Cys Ser  
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Asp Pro Glu Leu Gln Pro Ala Glu Arg Pro Leu Pro Ser Pro Gly Ser  
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 180 185 190  
 Glu Pro Thr Leu Tyr Trp Glu Lys Asp Gly Met Ala Leu Asp Glu Val  
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 Pro Gly Ala Ser Leu Ala Leu Arg Ile Leu Ala Ala Arg Leu Pro Asp  
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Glu  Glu  Phe  Cys  Glu  Ile  Phe  Arg  Ala  Lys  Asp  Lys  Thr  Thr  Gly  Lys
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Leu  His  Thr  Cys  Lys  Lys  Phe  Gln  Lys  Arg  Asp  Gly  Arg  Lys  Val  Arg
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Lys  Ala  Ala  Lys  Asn  Glu  Ile  Gly  Ile  Leu  Lys  Met  Val  Lys  His  Pro
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Asn  Ile  Leu  Gln  Leu  Val  Asp  Val  Phe  Val  Thr  Arg  Lys  Glu  Tyr  Phe
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Ile  Phe  Leu  Glu  Leu  Ala  Thr  Gly  Arg  Glu  Val  Phe  Asp  Trp  Ile  Leu
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Asn  Leu  Lys  Leu  Glu  Asn  Leu  Val  Tyr  Tyr  Asn  Arg  Leu  Lys  Asn  Ser
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Lys  Ile  Val  Ile  Ser  Asp  Phe  His  Leu  Ala  Lys  Leu  Glu  Asn  Gly  Leu
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<213> Homo sapiens

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| acgcttcccg | atagatggct  | acaggcccg   | gaggaggagg  | aggtggagtt | gctgcccttc  | 240  |
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<212> PRT

<213> Homo sapiens

<400> 10

Met Lys Asp Ser Ala Ser Ala Ala Ser Ala Gly Ala Glu Leu Val Leu





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| Glu Val Arg Leu Arg Arg Glu Leu Glu Lys Thr Ile Asn Gln Gln Arg |  |     |  |     |  |     |
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| Ile His Ile Gly Gln Gly Val Pro Val Val Ala Leu Ile Phe Glu Gly |  |     |  |     |  |     |
|   |  | 340 |  | 345 |  | 350 |
| Gly Pro Asn Val Ile Leu Thr Val Leu Glu Tyr Leu Gln Glu Ser Pro |  |     |  |     |  |     |
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| Pro Val Pro Val Val Val Cys Glu Gly Thr Gly Arg Ala Ala Asp Leu |  |     |  |     |  |     |
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| Leu Ala Tyr Ile His Lys Gln Thr Glu Glu Gly Gly Asp Ala Ala Glu |  |     |  |     |  |     |
| 385   |  | 390 |  | 395 |  | 400 |
| Pro Asp Ile Ile Ser Thr Ile Lys Lys Thr Phe Asn Phe Gly Gln Asn |  |     |  |     |  |     |
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| Glu Ala Leu His Leu Phe Gln Thr Leu Met Glu Cys Met Lys Arg Lys |  |     |  |     |  |     |
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| Glu Leu Val Thr Val Phe His Ile Gly Ser Asp Glu His Gln Asp Ile |  |     |  |     |  |     |
|   |  | 435 |  | 440 |  | 445 |
| Asp Val Ala Ile Leu Thr Ala Leu Leu Lys Gly Thr Asn Ala Ser Ala |  |     |  |     |  |     |
|   |  | 450 |  | 455 |  | 460 |
| Phe Asp Gln Leu Ile Leu Thr Leu Ala Trp Asp Arg Val Asp Ile Ala |  |     |  |     |  |     |
| 465   |  | 470 |  | 475 |  | 480 |
| Lys Asn His Val Phe Val Tyr Gly Gln Gln Trp Pro Leu His Ser Ser |  |     |  |     |  |     |
|   |  | 485 |  | 490 |  | 495 |
| Leu Gly Asn Arg Val Arg Leu Ser Leu Lys Lys Lys Lys Gln Lys Gln |  |     |  |     |  |     |
|   |  | 500 |  | 505 |  | 510 |
| Lys Gln Lys Gln Lys Gln Lys Pro Thr Pro Arg Asn Ser Glu Leu Val |  |     |  |     |  |     |
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| Gly Ser Leu Glu Gln Ala Met Leu Asp Ala Leu Val Met Asp Arg Val |  |     |  |     |  |     |
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| Ala Phe Val Lys Leu Leu Ile Glu Asn Gly Val Ser Met His Lys Phe |  |     |  |     |  |     |
| 545   |  | 550 |  | 555 |  | 560 |
| Leu Thr Ile Pro Arg Leu Glu Glu Leu Tyr Asn Thr Asn Leu Pro Pro |  |     |  |     |  |     |
|   |  | 565 |  | 570 |  | 575 |
| Gly Tyr Lys Ile Thr Leu Ile Asp Ile Gly Leu Val Ile Glu Tyr Leu |  |     |  |     |  |     |
|   |  | 580 |  | 585 |  | 590 |
| Met Gly Gly Thr Tyr Arg Cys Thr Tyr Thr Arg Lys Arg Phe Arg Leu |  |     |  |     |  |     |
|   |  | 595 |  | 600 |  | 605 |
| Ile Tyr Asn Ser Leu Gly Gly Asn Asn Arg Phe Ser Phe Gln Glu Pro |  |     |  |     |  |     |

| 610 |     |     |     |     | 615 |     |     |     |     | 620 |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | His | Thr | Arg | Thr | Val | Asn | Ile | Arg | Asp | Lys | Ser | Pro | His | Ala | Ser |
| 625 |     |     |     |     | 630 |     |     |     |     | 635 |     |     |     |     | 640 |
| Gly | Lys | Lys | Lys | Gly | Lys | Lys | Lys | Arg | Thr | Lys | Asp | Glu | Ile | Val | Asp |
|     |     |     |     | 645 |     |     |     |     | 650 |     |     |     |     | 655 |     |
| Ile | Asp | Asp | Pro | Glu | Thr | Lys | Arg | Phe | Pro | Tyr | Pro | Leu | Asn | Glu | Leu |
|     |     |     | 660 |     |     |     |     | 665 |     |     |     |     | 670 |     |     |
| Leu | Ile | Trp | Ala | Cys | Leu | Met | Lys | Arg | Gln | Val | Met | Ala | Arg | Phe | Leu |
|     |     | 675 |     |     |     |     | 680 |     |     |     |     | 685 |     |     |     |
| Trp | Gln | His | Gly | Glu | Glu | Ser | Met | Ala | Lys | Ala | Leu | Val | Ala | Cys | Lys |
|     |     | 690 |     |     |     |     | 695 |     |     |     |     | 700 |     |     |     |
| Ile | Tyr | Arg | Ser | Met | Ala | Tyr | Glu | Ala | Lys | Gln | Ser | Asp | Leu | Val | Asp |
| 705 |     |     |     |     | 710 |     |     |     |     | 715 |     |     |     |     | 720 |
| Asp | Thr | Ser | Glu | Glu | Leu | Lys | Gln | Tyr | Ser | Lys | Asp | Phe | Gly | Gln | Leu |
|     |     |     | 725 |     |     |     |     |     | 730 |     |     |     |     | 735 |     |
| Ala | Val | Glu | Leu | Leu | Glu | Gln | Ser | Phe | Arg | Gln | Asp | Glu | Thr | Met | Ala |
|     |     |     | 740 |     |     |     |     | 745 |     |     |     |     | 750 |     |     |
| Met | Lys | Leu | Leu | Thr | Tyr | Glu | Leu | Lys | Asn | Trp | Ser | Asn | Ser | Thr | Cys |
|     |     | 755 |     |     |     |     | 760 |     |     |     |     | 765 |     |     |     |
| Leu | Lys | Leu | Ala | Val | Ser | Ser | Arg | Leu | Arg | Pro | Phe | Val | Ala | His | Thr |
|     |     | 770 |     |     |     |     | 775 |     |     |     |     | 780 |     |     |     |
| Cys | Thr | Gln | Met | Leu | Leu | Ser | Asp | Met | Trp | Met | Gly | Arg | Leu | Asn | Met |
| 785 |     |     |     |     |     |     | 790 |     |     |     |     | 795 |     |     | 800 |
| Arg | Lys | Asn | Ser | Trp | Tyr | Lys | Val | Ile | Leu | Ser | Ile | Leu | Val | Pro | Pro |
|     |     |     | 805 |     |     |     |     |     | 810 |     |     |     |     | 815 |     |
| Ala | Ile | Leu | Leu | Leu | Glu | Tyr | Lys | Thr | Lys | Ala | Glu | Met | Ser | His | Ile |
|     |     | 820 |     |     |     |     |     | 825 |     |     |     |     | 830 |     |     |
| Pro | Gln | Ser | Gln | Asp | Ala | His | Gln | Met | Thr | Met | Asp | Asp | Ser | Glu | Asn |
|     |     | 835 |     |     |     |     | 840 |     |     |     |     | 845 |     |     |     |
| Asn | Ser | Asn | Glu | Gly | Lys | Asn | Glu | Met | Glu | Ile | Gln | Met | Lys | Ser | Lys |
|     |     | 850 |     |     |     |     | 855 |     |     |     |     | 860 |     |     |     |
| Lys | Leu | Pro | Ile | Thr | Arg | Lys | Phe | Tyr | Ala | Phe | Tyr | His | Ala | Pro | Ile |
| 865 |     |     |     |     |     | 870 |     |     |     |     | 875 |     |     |     | 880 |
| Val | Lys | Phe | Trp | Phe | Asn | Thr | Leu | Ala | Tyr | Leu | Gly | Phe | Leu | Met | Leu |
|     |     |     | 885 |     |     |     |     |     | 890 |     |     |     |     | 895 |     |
| Tyr | Thr | Phe | Val | Val | Leu | Val | Gln | Met | Glu | Gln | Leu | Pro | Ser | Val | Gln |
|     |     |     | 900 |     |     |     |     | 905 |     |     |     |     | 910 |     |     |
| Glu | Trp | Ile | Val | Ile | Ala | Tyr | Ile | Phe | Thr | Tyr | Ala | Ile | Glu | Lys | Val |

| 915  | 920 | 925 |
|--|-----|-----|
| Arg Glu Ile Phe Met Ser Glu Ala Gly Lys Val Asn Gln Lys Ile Lys<br>930 935 940         |     |     |
| Val Trp Phe Ser Asp Tyr Phe Asn Ile Ser Asp Thr Ile Ala Ile Ile<br>945 950 955 960     |     |     |
| Ser Phe Phe Ile Gly Phe Gly Leu Arg Phe Gly Ala Lys Trp Asn Phe<br>965 970 975         |     |     |
| Ala Asn Ala Tyr Asp Asn His Val Phe Val Ala Gly Arg Leu Ile Tyr<br>980 985 990         |     |     |
| Cys Leu Asn Ile Ile Phe Trp Tyr Val Arg Leu Leu Asp Phe Leu Ala<br>995 1000 1005       |     |     |
| Val Asn Gln Gln Ala Gly Pro Tyr Val Met Met Ile Gly Lys Met Val<br>1010 1015 1020      |     |     |
| Asn Met Phe Tyr Ile Val Val Ile Met Ala Leu Val Leu Leu Ser Phe<br>1025 1030 1035 1040 |     |     |
| Gly Val Pro Arg Lys Ala Ile Leu Tyr Pro His Glu Ala Pro Ser Trp<br>1045 1050 1055      |     |     |
| Thr Leu Ala Lys Asp Ile Val Phe His Pro Tyr Trp Met Ile Phe Gly<br>1060 1065 1070      |     |     |
| Glu Val Tyr Ala Tyr Glu Ile Asp Cys Gly Pro Gly Thr Trp Leu Thr<br>1075 1080 1085      |     |     |
| Pro Phe Leu Gln Ala Val Tyr Leu Phe Val Gln Tyr Ile Ile Met Val<br>1090 1095 1100      |     |     |
| Asn Leu Leu Ile Ala Phe Phe Lys Ser Asn Val Tyr Leu Gln Val Lys<br>1105 1110 1115 1120 |     |     |
| Ala Ile Ser Asn Ile Val Trp Lys Tyr Gln Arg Tyr His Phe Ile Met<br>1125 1130 1135      |     |     |
| Ala Tyr His Glu Lys Pro Val Leu Pro Pro Pro Leu Ile Ile Leu Ser<br>1140 1145 1150      |     |     |
| His Ile Val Ser Leu Phe Cys Cys Ile Cys Lys Arg Arg Lys Lys Asp<br>1155 1160 1165      |     |     |
| Lys Thr Ser Asp Gly Pro Ser Lys Ile Glu Leu Phe Leu Thr Glu Glu<br>1170 1175 1180      |     |     |
| Asp Gln Lys Lys Leu His Asp Phe Glu Glu Gln Cys Val Glu Met Tyr<br>1185 1190 1195 1200 |     |     |
| Phe Asn Glu Lys Asp Asp Lys Phe His Ser Gly Ser Glu Glu Arg Ile<br>1205 1210 1215      |     |     |
| Arg Val Thr Phe Glu Arg Val Glu Gln Lys Pro Ile Gln Ile Lys Glu                        |     |     |

| 1220   | 1225 | 1230 |
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| Val Gly Asp Arg Val Asn Tyr Ile Lys Arg Ser Leu Gln Ser Leu Asp<br>1235 1240 1245      |      |      |
| Ser Gln Ile Gly His Leu Gln Asp Leu Ser Ala Leu Thr Val Asp Thr<br>1250 1255 1260      |      |      |
| Leu Lys Thr Leu Thr Ala Gln Lys Ala Ser Glu Ala Ser Lys Val His<br>1265 1270 1275 1280 |      |      |
| Asn Glu Ile Thr Arg Glu Leu Ser Ile Ser Lys His Leu Ala Gln Asn<br>1285 1290 1295      |      |      |
| Leu Ile Asp Asp Gly Pro Val Arg Pro Ser Val Trp Lys Lys His Gly<br>1300 1305 1310      |      |      |
| Val Val Asn Thr Leu Ser Ser Ser Leu Pro Gln Gly Asp Leu Glu Ser<br>1315 1320 1325      |      |      |
| Asn Asn Pro Phe His Cys Asn Ile Leu Met Lys Asp Asp Lys Asp Pro<br>1330 1335 1340      |      |      |
| Gln Cys Asn Ile Phe Gly Gln Asp Leu Pro Ala Val Pro Gln Arg Lys<br>1345 1350 1355 1360 |      |      |
| Glu Phe Asn Phe Pro Glu Ala Gly Ser Ser Ser Gly Ala Leu Phe Pro<br>1365 1370 1375      |      |      |
| Ser Ala Val Ser Pro Pro Glu Leu Arg Gln Arg Leu His Gly Val Glu<br>1380 1385 1390      |      |      |
| Leu Leu Lys Ile Phe Asn Lys Asn Gln Lys Leu Gly Ser Ser Ser Thr<br>1395 1400 1405      |      |      |
| Ser Ile Pro His Leu Ser Ser Pro Pro Thr Lys Phe Phe Val Ser Thr<br>1410 1415 1420      |      |      |
| Pro Ser Gln Pro Ser Cys Lys Ser His Leu Glu Thr Gly Thr Lys Asp<br>1425 1430 1435 1440 |      |      |
| Gln Glu Thr Val Cys Ser Lys Ala Thr Glu Gly Asp Asn Thr Glu Phe<br>1445 1450 1455      |      |      |
| Gly Ala Phe Val Gly His Arg Asp Ser Met Asp Leu Gln Arg Phe Lys<br>1460 1465 1470      |      |      |
| Glu Thr Ser Asn Lys Ile Lys Leu Gln Asn Asn Asn Thr Ser Glu Asn<br>1475 1480 1485      |      |      |
| Thr Leu Lys Arg Val Ser Ser Leu Ala Gly Phe Thr Asp Cys His Arg<br>1490 1495 1500      |      |      |
| Thr Ser Ile Pro Val His Ser Lys Gln Ala Glu Lys Ile Ser Arg Arg<br>1505 1510 1515 1520 |      |      |
| Pro Ser Thr Glu Asp Thr His Glu Val Asp Ser Lys Ala Ala Leu Ile                        |      |      |

|   |      |      |
|---|------|------|
| 1525  | 1530 | 1535 |
| Pro Asp Trp Leu Gln Asp Arg Pro Ser Asn Arg Glu Met Gly Leu Thr<br>1540 | 1545 | 1550 |
| Ser Pro Phe Lys Pro Ala Met Asp Thr Asn Tyr Tyr Tyr Ser Ala Val<br>1555 | 1560 | 1565 |
| Glu Arg Asn Asn Leu Met Arg Leu Ser Gln Ser Ile Pro Phe Thr Pro<br>1570 | 1575 | 1580 |
| Val Pro Pro Arg Gly Glu Pro Val Thr Val Tyr Arg Leu Glu Glu Ser<br>1585 | 1590 | 1595 |
| Ser Pro Asn Ile Leu Asn Asn Ser Met Ser Ser Trp Ser Gln Leu Gly<br>1605 | 1610 | 1615 |
| Leu Cys Ala Lys Ile Glu Phe Leu Ser Lys Glu Glu Met Gly Gly Gly<br>1620 | 1625 | 1630 |
| Leu Arg Arg Ala Val Lys Val Gln Cys Thr Trp Ser Glu His Asp Ile<br>1635 | 1640 | 1645 |
| Leu Lys Ser Gly His Leu Tyr Ile Ile Lys Ser Phe Leu Pro Glu Val<br>1650 | 1655 | 1660 |
| Val Asn Thr Trp Ser Ser Ile Tyr Lys Glu Asp Thr Val Leu His Leu<br>1665 | 1670 | 1675 |
| Cys Leu Arg Glu Ile Gln Gln Gln Arg Ala Ala Gln Lys Leu Thr Phe<br>1685 | 1690 | 1695 |
| Ala Phe Asn Gln Met Lys Pro Lys Ser Ile Pro Tyr Ser Pro Gly Glu<br>1700 | 1705 | 1710 |
| Leu Leu Val Leu Asp Leu Gln Gly Val Gly Glu Asn Leu Thr Asp Pro<br>1715 | 1720 | 1725 |
| Ser Val Ile Lys Ala Glu Glu Lys Arg Ser Cys Asp Met Val Phe Gly<br>1730 | 1735 | 1740 |
| Pro Ala Asn Leu Gly Glu Asp Ala Ile Lys Asn Phe Arg Ala Lys His<br>1745 | 1750 | 1755 |
| His Cys Asn Ser Cys Cys Arg Lys Leu Lys Leu Pro Asp Leu Lys Arg<br>1765 | 1770 | 1775 |
| Asn Asp Tyr Thr Pro Asp Lys Ile Ile Phe Pro Gln Asp Glu Pro Ser<br>1780 | 1785 | 1790 |
| Asp Leu Asn Leu Gln Pro Gly Asn Ser Thr Lys Glu Ser Glu Ser Thr<br>1795 | 1800 | 1805 |
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 35 40 45  
 Asn Thr Val Ala Phe Thr Glu Val Met Gly Met Leu Trp Arg Arg Leu  
 50 55 60

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Asn | Asp | Ser | Gly | Lys | Asn | Trp | Arg | His | Val | Tyr | Lys | Ala | Leu | Thr | Leu |  |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |  |
| Leu | Asp | Tyr | Leu | Leu | Lys | Thr | Gly | Ser | Glu | Arg | Val | Ala | His | Gln | Cys |  |
|     |     |     | 85  |     |     |     |     |     | 90  |     |     |     |     | 95  |     |  |
| Arg | Glu | Asn | Leu | Tyr | Thr | Ile | Gln | Thr | Leu | Lys | Asp | Phe | Gln | Tyr | Ile |  |
|     |     | 100 |     |     |     |     |     | 105 |     |     |     |     | 110 |     |     |  |
| Asp | Arg | Asp | Gly | Lys | Asp | Gln | Gly | Val | Asn | Val | Arg | Glu | Lys | Val | Lys |  |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |  |
| Gln | Val | Met | Ala | Leu | Leu | Lys | Asp | Glu | Glu | Arg | Leu | Arg | Gln | Glu | Arg |  |
| 130 |     |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |  |
| Thr | His | Ala | Leu | Lys | Thr | Lys | Glu | Arg | Met | Ala | Leu | Glu | Gly | Ile | Gly |  |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |  |
| Pro | Leu | Val | Leu | Gly | Phe | Ser | Arg | Arg | Tyr | Gly | Glu | Asp | Tyr | Ser | Arg |  |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |  |
| Ser | Arg | Gly | Ser | Pro | Ser | Ser | Tyr | Asn | Ser | Ser | Ser | Ser | Ser | Pro | Arg |  |
|     |     | 180 |     |     |     |     |     | 185 |     |     |     |     |     | 190 |     |  |
| Tyr | Thr | Ser | Asp | Leu | Glu | Gln | Ala | Arg | Pro | Gln | Thr | Ser | Gly | Glu | Glu |  |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |  |
| Glu | Leu | Gln | Leu | Gln | Leu | Ala | Leu | Ala | Met | Ser | Arg | Glu | Glu | Ala | Glu |  |
| 210 |     |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |  |
| Lys | Glu | Val | Arg | Ser | Trp | Gln | Gly | Asp | Gly | Ser | Pro | Met | Ala | Asn | Gly |  |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |  |
| Ala | Gly | Ala | Val | Val | His | His | Gln | Arg | Asp | Arg | Glu | Pro | Glu | Arg | Glu |  |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |  |
| Glu | Arg | Lys | Glu | Glu | Glu | Lys | Leu | Lys | Thr | Ser | Gln | Ser | Ser | Ile | Leu |  |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     |     | 270 |     |  |
| Asp | Leu | Ala | Asp | Ile | Phe | Val | Pro | Ala | Leu | Ala | Pro | Pro | Ser | Thr | His |  |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |  |
| Cys | Ser | Ala | Asp | Pro | Trp | Asp | Ile | Pro | Gly | Phe | Arg | Pro | Asn | Thr | Glu |  |
|     |     | 290 |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |  |
| Ala | Ser | Gly | Ser | Ser | Trp | Gly | Pro | Ser | Ala | Asp | Pro | Trp | Ser | Pro | Ile |  |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |  |
| Pro | Ser | Gly | Thr | Val | Leu | Ser | Arg | Ser | Gln | Pro | Trp | Asp | Leu | Thr | Pro |  |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |  |
| Met | Leu | Ser | Ser | Ser | Glu | Pro | Trp | Gly | Arg | Thr | Pro | Val | Leu | Pro | Ala |  |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |  |
| Gly | Pro | Pro | Thr | Thr | Asp | Pro | Trp | Ala | Leu | Asn | Ser | Pro | His | His | Lys |  |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |  |

Leu Pro Ser Thr Gly Ala Asp Pro Trp Gly Ala Ser Leu Glu Thr Ser  
 370 375 380  
 Asp Thr Pro Gly Gly Ala Ser Thr Phe Asp Pro Phe Ala Lys Pro Pro  
 385 390 395 400  
 Glu Ser Thr Glu Thr Lys Glu Gly Leu Glu Gln Ala Leu Pro Ser Gly  
 405 410 415  
 Lys Pro Ser Ser Ser Gly Glu Leu Asp Leu Phe Gly Asp Pro Ser Pro  
 420 425 430  
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Phe Ser Ser Ala Phe Ser Ser Asp Ser Lys Ser Ser Ser Gln Gly Leu  
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|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
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| Gln | Phe | Leu | Asp | Ser | Lys | Ala | Ser | Ala | Gly | Ile | Ser | Asp | Ser | Ser | Trp | 65  | 70  | 75  |
| Phe | Pro | Glu | Ala | Leu | Ser | Ser | Asn | Met | Ser | Gly | Ser | Phe | Trp | Ser | Asn | 85  | 90  | 95  |
| Val | Ser | Ala | Glu | Gly | Gln | Asp | Leu | Ser | Pro | Val | Ser | Pro | Phe | Ser | Glu | 100 | 105 | 110 |
| Thr | Pro | Gly | Ser | Glu | Val | Phe | Pro | Asp | Ile | Ser | Asp | Pro | Gln | Val | Pro | 115 | 120 | 125 |
| Ala | Lys | Asp | Pro | Lys | Pro | Ser | Phe | Thr | Val | Lys | Thr | Pro | Ala | Ser | Asn | 130 | 135 | 140 |
| Ile | Ser | Thr | Gln | Val | Ser | His | Thr | Lys | Leu | Ser | Val | Glu | Ala | Pro | Asp | 145 | 150 | 155 |
| Ser | Lys | Phe | Ser | Pro | Asp | Asp | Met | Asp | Leu | Lys | Leu | Ser | Ala | Gln | Ser | 165 | 170 | 175 |
| Pro | Glu | Ser | Lys | Phe | Ser | Ala | Glu | Thr | His | Ser | Ala | Ala | Ser | Phe | Pro | 180 | 185 | 190 |
| Gln | Gln | Val | Gly | Gly | Pro | Leu | Ala | Val | Leu | Val | Gly | Thr | Thr | Ile | Arg | 195 | 200 | 205 |
| Leu | Pro | Leu | Val | Pro | Ile | Pro | Asn | Pro | Gly | Pro | Pro | Thr | Ser | Leu | Val | 210 | 215 | 220 |
| Val | Trp | Arg | Arg | Gly | Ser | Lys | Val | Leu | Ala | Ala | Gly | Gly | Leu | Gly | Pro | 225 | 230 | 235 |
| Gly | Ala | Pro | Leu | Ile | Ser | Leu | Asp | Pro | Ala | His | Arg | Asp | His | Leu | Arg | 245 | 250 | 255 |
| Phe | Asp | Gln | Ala | Arg | Gly | Val | Leu | Glu | Leu | Ala | Ser | Ala | Gln | Leu | Asp | 260 | 265 | 270 |
| Asp | Ala | Gly | Val | Tyr | Thr | Ala | Glu | Val | Ile | Arg | Ala | Gly | Val | Ser | Gln | 275 | 280 | 285 |
| Gln | Thr | His | Glu | Phe | Thr | Val | Gly | Val | Tyr | Glu | Pro | Leu | Pro | Gln | Leu | 290 | 295 | 300 |
| Ser | Val | Gln | Pro | Lys | Ala | Pro | Glu | Thr | Glu | Glu | Gly | Ala | Ala | Glu | Leu | 305 | 310 | 315 |
| Arg | Leu | Arg | Cys | Leu | Gly | Trp | Gly | Pro | Gly | Arg | Gly | Glu | Leu | Ser | Trp | 325 | 330 | 335 |
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 <212> PRT

<213> Homo sapiens

<400> 18

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Asp Cys Lys Leu Ala Arg Gly Gly Pro Pro Ala Thr Ile Val Ala Ile  
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Asp Glu Glu Ser Arg Asn Gly Ala Gly Thr Ile Leu Val Asp Asn Met  
50 55 60  
Leu Ile Lys Gly Thr Ala Gly Gly Pro Asp Pro Thr Ile Glu Leu Ser  
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Leu Lys Asp Asn Val Asp Tyr Trp Val Leu Met Asp Pro Val Lys Gln  
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Met Leu Phe Leu Asn Ser Thr Gly Arg Val Leu Asp Arg Asp Pro Pro  
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Met Asn Ile His Ser Ile Val Val Gln Val Gln Cys Ile Asn Lys Lys  
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Val Gly Thr Ile Ile Tyr His Glu Val Arg Ile Val Val Arg Asp Arg  
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| Glu | Val | Leu | Pro | Pro | Asn | Asn | Gln | Ser | Pro | Pro | Arg | Phe | Pro | Gln | Leu | 610 | 615 | 620 |
| Met | Tyr | Ser | Leu | Glu | Ile | Ser | Glu | Ala | Met | Arg | Val | Gly | Ala | Val | Leu | 625 | 630 | 635 |
| Leu | Asn | Leu | Gln | Ala | Thr | Asp | Arg | Glu | Gly | Asp | Ser | Ile | Thr | Tyr | Ala | 645 | 650 | 655 |
| Ile | Glu | Asn | Gly | Asp | Pro | Gln | Arg | Val | Phe | Asn | Leu | Ser | Glu | Thr | Thr | 660 | 665 | 670 |
| Gly | Ile | Leu | Thr | Leu | Gly | Lys | Ala | Leu | Asp | Arg | Glu | Ser | Thr | Asp | Arg | 675 | 680 | 685 |
| Tyr | Ile | Leu | Ile | Ile | Thr | Ala | Ser | Asp | Gly | Arg | Pro | Asp | Gly | Thr | Ser | 690 | 695 | 700 |
| Thr | Ala | Thr | Val | Asn | Ile | Met | Val | Thr | Asp | Val | Asn | Asp | Asn | Ala | Pro | 705 | 710 | 715 |
| Val | Phe | Asp | Pro | Tyr | Leu | Pro | Arg | Asn | Leu | Ser | Val | Val | Glu | Glu | Glu | 725 | 730 | 735 |
| Ala | Asn | Ala | Phe | Val | Gly | Gln | Val | Lys | Ala | Thr | Asp | Pro | Asp | Ala | Gly | 740 | 745 | 750 |
| Ile | Asn | Gly | Gln | Val | His | Tyr | Ser | Leu | Gly | Asn | Phe | Asn | Asn | Leu | Phe | 755 | 760 | 765 |
| Arg | Ile | Thr | Ser | Asn | Gly | Ser | Ile | Tyr | Thr | Ala | Val | Lys | Leu | Asn | Arg | 770 | 775 | 780 |
| Glu | Val | Arg | Asp | Tyr | Tyr | Glu | Leu | Val | Val | Val | Ala | Thr | Asp | Gly | Ala | 785 | 790 | 795 |
| Val | His | Pro | Arg | His | Ser | Thr | Leu | Thr | Leu | Ala | Ile | Lys | Val | Leu | Asp | 805 | 810 | 815 |
| Ile | Asp | Asp | Asn | Ser | Pro | Val | Phe | Thr | Asn | Ser | Thr | Tyr | Thr | Val | Leu | 820 | 825 | 830 |
| Val | Glu | Glu | Asn | Leu | Pro | Ala | Gly | Thr | Thr | Ile | Leu | Gln | Ile | Glu | Ala | 835 | 840 | 845 |
| Lys | Asp | Val | Asp | Leu | Gly | Ala | Asn | Val | Ser | Tyr | Arg | Ile | Arg | Ser | Pro | 850 | 855 | 860 |
| Glu | Val | Lys | His | Phe | Phe | Ala | Leu | His | Pro | Phe | Thr | Gly | Glu | Leu | Ser | 865 | 870 | 875 |
| Leu | Leu | Arg | Ser | Leu | Asp | Tyr | Glu | Ala | Phe | Pro | Asp | Gln | Glu | Ala | Ser | 885 | 890 | 895 |

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| Asn Asp Asn Ser Pro Thr Phe Lys His Glu Ser Tyr Tyr Ala Thr Val<br>145 150 155 160 |     |     |
| Asn Glu Leu Thr Pro Val Gly Thr Thr Ile Phe Thr Gly Phe Ser Gly<br>165 170 175     |     |     |
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| Tyr Val Ile Gln Tyr Asn Pro Asp Asp Pro Thr Ser Asn Asp Thr Phe<br>195 200 205     |     |     |
| Glu Ile Pro Leu Met Leu Thr Gly Asn Ile Val Leu Arg Lys Arg Leu<br>210 215 220     |     |     |
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| Thr Pro Pro Ile Gln Ala Ile Asp Gln Asp Arg Asn Ile Gln Pro Pro<br>305 310 315 320 |     |     |
| Ser Asp Arg Pro Gly Ile Leu Tyr Ser Ile Leu Val Gly Thr Pro Glu<br>325 330 335     |     |     |
| Asp Tyr Pro Arg Phe Phe His Met His Pro Arg Thr Ala Glu Leu Ser<br>340 345 350     |     |     |
| Leu Leu Glu Pro Val Asn Arg Asp Phe His Gln Lys Phe Asp Leu Val<br>355 360 365     |     |     |
| Ile Lys Ala Glu Gln Asp Asn Gly His Pro Leu Pro Ala Phe Ala Ser<br>370 375 380     |     |     |
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| Val Ile Val Asn Ile Gln Val Met Asp Ala Asn Asp Asn Thr Pro Thr<br>500 505 510     |     |     |
| Phe Pro Glu Ile Ser Tyr Asp Val Tyr Val Tyr Thr Asp Met Arg Pro<br>515 520 525     |     |     |
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| Tyr Ser Leu Glu Ile Ser Glu Ala Met Arg Val Gly Ala Val Leu Leu<br>625 630 635 640 |     |     |
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| Ala Thr Val Asn Ile Val Val Thr Asp Val Asn Asp Asn Ala Pro Val<br>705 710 715 720 |     |     |
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| Asn  | Ala | Phe | Val | Gly  | Gln | Val | Lys | Ala  | Thr | Asp | Pro | Asp | Ala | Gly | Ile |  |  |
| 740  |     |     |     | 745  |     |     |     | 750  |     |     |     |     |     |     |     |  |  |
| Asn  | Gly | Gln | Val | His  | Tyr | Ser | Leu | Gly  | Asn | Phe | Asn | Asn | Leu | Phe | Arg |  |  |
| 755  |     |     |     | 760  |     |     |     | 765  |     |     |     |     |     |     |     |  |  |
| Ile  | Thr | Ser | Asn | Gly  | Ser | Ile | Tyr | Thr  | Ala | Val | Lys | Leu | Asn | Arg | Glu |  |  |
| 770  |     |     |     | 775  |     |     |     | 780  |     |     |     |     |     |     |     |  |  |
| Val  | Arg | Asp | Tyr | Tyr  | Glu | Leu | Val | Val  | Val | Ala | Thr | Asp | Gly | Ala | Val |  |  |
| 785  |     |     |     | 790  |     |     |     | 795  |     |     |     | 800 |     |     |     |  |  |
| His  | Pro | Arg | His | Ser  | Thr | Leu | Thr | Leu  | Ala | Ile | Lys | Val | Leu | Asp | Ile |  |  |
| 805  |     |     |     | 810  |     |     |     | 815  |     |     |     |     |     |     |     |  |  |
| Asp  | Asp | Asn | Ser | Pro  | Val | Phe | Thr | Asn  | Ser | Thr | Tyr | Thr | Val | Leu | Val |  |  |
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| Glu  | Glu | Asn | Leu | Pro  | Ala | Gly | Thr | Thr  | Ile | Leu | Gln | Ile | Glu | Ala | Lys |  |  |
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| Asp  | Val | Asp | Leu | Gly  | Ala | Asn | Val | Ser  | Tyr | Arg | Ile | Arg | Ser | Pro | Glu |  |  |
| 850  |     |     |     | 855  |     |     |     | 860  |     |     |     |     |     |     |     |  |  |
| Val  | Lys | His | Phe | Phe  | Ala | Leu | His | Pro  | Phe | Thr | Gly | Glu | Leu | Ser | Leu |  |  |
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| Leu  | Arg | Ser | Leu | Asp  | Tyr | Glu | Ala | Phe  | Pro | Asp | Gln | Glu | Ala | Ser | Ile |  |  |
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| Thr  | Phe | Leu | Val | Glu  | Ala | Phe | Asp | Ile  | Tyr | Gly | Thr | Met | Pro | Pro | Gly |  |  |
| 900  |     |     |     | 905  |     |     |     | 910  |     |     |     |     |     |     |     |  |  |
| Ile  | Ala | Thr | Val | Thr  | Val | Ile | Val | Lys  | Asp | Met | Asn | Asp | Tyr | Pro | Pro |  |  |
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| Val  | Phe | Ser | Lys | Arg  | Ile | Tyr | Lys | Gly  | Met | Val | Ala | Pro | Asp | Ala | Val |  |  |
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| Lys  | Gly | Thr | Pro | Ile  | Thr | Thr | Val | Tyr  | Ala | Glu | Asp | Ala | Asp | Pro | Pro |  |  |
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| Pro  | Tyr | Pro | Ala | Ser  | Ile | Phe | Glu | Val  | Glu | Glu | Asp | Ser | Gly | Arg | Val |  |  |
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| Ile  | Thr | Arg | Val | Asn  | Leu | Asn | Glu | Glu  | Pro | Thr | Thr | Ile | Phe | Lys | Leu |  |  |
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| Val  | Val | Val | Ala | Phe  | Asp | Asp | Gly | Glu  | Pro | Val | Met | Ser | Ser | Ser | Ala |  |  |
| 1010 |     |     |     | 1015 |     |     |     | 1020 |     |     |     |     |     |     |     |  |  |
| Thr  | Val | Lys | Ile | Leu  | Val | Leu | His | Pro  | Gly | Glu | Ile | Pro | Arg | Phe | Thr |  |  |

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| Gln Glu Glu Tyr Arg Pro Pro Pro Val Ser Glu Leu Ala Thr Lys Gly | 1045 | 1050 | 1055 |
| Thr Met Val Gly Val Ile Ser Ala Ala Ala Ile Asn Gln Ser Ile Val | 1060 | 1065 | 1070 |
| Tyr Ser Ile Val Ser Gly Asn Glu Glu Asp Thr Phe Gly Ile Asn Asn | 1075 | 1080 | 1085 |
| Ile Thr Gly Val Ile Tyr Val Asn Gly Pro Leu Asp Tyr Glu Thr Arg | 1090 | 1095 | 1100 |
| Thr Ser Tyr Val Leu Arg Val Gln Ala Asp Ser Leu Glu Val Val Leu | 1105 | 1110 | 1115 |
| Ala Asn Leu Arg Val Pro Ser Lys Ser Asn Thr Ala Lys Val Tyr Ile | 1125 | 1130 | 1135 |
| Glu Ile Gln Asp Glu Asn Asn His Pro Pro Val Phe Gln Lys Lys Phe | 1140 | 1145 | 1150 |
| Tyr Ile Gly Gly Val Ser Glu Asp Ala Arg Met Phe Thr Ser Val Leu | 1155 | 1160 | 1165 |
| Arg Val Lys Ala Thr Asp Lys Asp Thr Gly Asn Tyr Ser Val Met Ala | 1170 | 1175 | 1180 |
| Tyr Arg Leu Ile Ile Pro Pro Ile Lys Glu Gly Lys Glu Gly Phe Val | 1185 | 1190 | 1195 |
| Val Glu Thr Tyr Thr Gly Leu Ile Lys Thr Ala Met Leu Phe His Asn | 1205 | 1210 | 1215 |
| Met Arg Arg Ser Tyr Phe Lys Phe Gln Val Ile Ala Thr Asp Asp Tyr | 1220 | 1225 | 1230 |
| Gly Lys Gly Leu Ser Gly Lys Ala Asp Val Leu Val Ser Val Ser Val | 1235 | 1240 | 1245 |
| Val Asn Gln Leu Asp Met Gln Val Ile Val Ser Asn Val Pro Pro Thr | 1250 | 1255 | 1260 |
| Leu Val Glu Lys Lys Ile Glu Asp Leu Thr Glu Ile Leu Asp Arg Tyr | 1265 | 1270 | 1275 |
| Val Gln Glu Gln Ile Pro Gly Ala Lys Val Val Val Glu Ser Ile Gly | 1285 | 1290 | 1295 |
| Ala Arg Arg His Gly Asp Ala Phe Ser Leu Glu Asp Tyr Thr Lys Cys | 1300 | 1305 | 1310 |
| Asp Leu Thr Val Tyr Ala Ile Asp Pro Gln Thr Asn Arg Ala Ile Asp | 1315 | 1320 | 1325 |
| Arg Asn Glu Leu Phe Lys Phe Leu Asp Gly Lys Leu Leu Asp Ile Asn |      |      |      |





| 1635  | 1640 | 1645      |
|---|------|-----------|
| Asn Leu Thr Glu Lys Glu Glu Ile Arg Gln Gly Glu Thr Leu Met Ile<br>1650 | 1655 | 1660      |
| Glu Gly Thr Glu Gln Leu Lys Ser Leu Ser Ser Asp Ser Ser Phe Cys<br>1665 | 1670 | 1675 1680 |
| Phe Pro Arg Pro His Phe Ser Phe Ser Thr Leu Pro Thr Val Ser Arg<br>1685 | 1690 | 1695      |
| Thr Val Glu Leu Lys Ser Glu Pro Asn Val Ile Ser Ser Pro Ala Glu<br>1700 | 1705 | 1710      |
| Cys Ser Leu Glu Leu Ser Pro Ser Arg Pro Cys Val Leu His Ser Ser<br>1715 | 1720 | 1725      |
| Leu Ser Arg Arg Glu Thr Pro Ile Cys Met Leu Pro Ile Glu Thr Glu<br>1730 | 1735 | 1740      |
| Arg Asn Ile Phe Glu Asn Phe Ala His Pro Pro Asn Ile Ser Pro Ser<br>1745 | 1750 | 1755 1760 |
| Ala Cys Pro Leu Pro Pro Pro Pro Pro Ile Ser Pro Pro Ser Pro Pro<br>1765 | 1770 | 1775      |
| Pro Ala Pro Ala Pro Leu Ala Pro Pro Pro Asp Ile Ser Pro Phe Ser<br>1780 | 1785 | 1790      |
| Leu Phe Cys Pro Pro Pro Ser Pro Pro Ser Ile Pro Leu Pro Leu Pro<br>1795 | 1800 | 1805      |
| Pro Pro Thr Phe Phe Pro Leu Ser Val Ser Thr Ser Gly Pro Pro Thr<br>1810 | 1815 | 1820      |
| Pro Pro Leu Leu Pro Pro Phe Pro Thr Pro Leu Pro Pro Pro Pro<br>1825     | 1830 | 1835 1840 |
| Ser Ile Pro Cys Pro Pro Pro Pro Ser Ala Ser Phe Leu Ser Thr Glu<br>1845 | 1850 | 1855      |
| Cys Val Cys Ile Thr Gly Val Lys Cys Thr Thr Asn Leu Met Pro Ala<br>1860 | 1865 | 1870      |
| Glu Lys Ile Lys Ser Ser Met Thr Gln Leu Ser Thr Thr Thr Val Cys<br>1875 | 1880 | 1885      |
| Lys Thr Asp Pro Gln Arg Glu Pro Lys Gly Ile Leu Arg His Val Lys<br>1890 | 1895 | 1900      |
| Asn Leu Ala Glu Leu Glu Lys Ser Val Ala Asn Met Tyr Ser Gln Ile<br>1905 | 1910 | 1915 1920 |
| Glu Lys Asn Tyr Leu Arg Thr Asn Val Ser Glu Leu Gln Thr Met Cys<br>1925 | 1930 | 1935      |
| Pro Ser Glu Val Thr Asn Met Glu Ile Thr Ser Glu Gln Asn Lys Gly         |      |           |

|   |      |      |
|---|------|------|
| 1940  | 1945 | 1950 |
| Ser Leu Asn Asn Ile Val Glu Gly Thr Glu Lys Gln Ser His Ser Gln |      |      |
| 1955  | 1960 | 1965 |
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| 1970  |      |      |

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<400> 21

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<212> PRT

<213> Homo sapiens

<400> 22

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| Met | Asp | Ile | Ile | Met | Gly | His | Cys | Val | Gly | Thr | Arg | Pro | Pro | Ala | Cys |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Cys | Leu | Ile | Leu | Leu | Leu | Phe | Lys | Leu | Leu | Ala | Thr | Val | Ser | Gln | Gly |
|     | 20  |     |     |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Leu | Pro | Gly | Thr | Gly | Pro | Leu | Gly | Phe | His | Phe | Thr | His | Ser | Ile | Tyr |
|     | 35  |     |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Asn | Ala | Thr | Val | Tyr | Glu | Asn | Ser | Ala | Ala | Arg | Thr | Tyr | Val | Asn | Ser |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Gln | Ser | Arg | Met | Gly | Ile | Thr | Leu | Ile | Asp | Leu | Ser | Trp | Asp | Ile | Lys |
|     | 65  |     |     |     | 70  |     |     |     |     | 75  |     |     |     | 80  |     |
| Tyr | Arg | Ile | Val | Ser | Gly | Asp | Glu | Glu | Gly | Phe | Phe | Lys | Ala | Glu | Glu |
|     |     | 85  |     |     |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Val | Ile | Ile | Ala | Asp | Phe | Cys | Phe | Leu | Arg | Ile | Arg | Thr | Lys | Gly | Gly |
|     |     | 100 |     |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Asn | Ser | Ala | Ile | Leu | Asn | Arg | Glu | Ile | Gln | Asp | Asn | Tyr | Leu | Leu | Ile |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Val | Lys | Gly | Ser | Val | Arg | Gly | Glu | Asp | Leu | Glu | Ala | Trp | Thr | Lys | Val |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Asn | Ile | Gln | Val | Leu | Asp | Met | Asn | Asp | Leu | Arg | Pro | Leu | Phe | Ser | Pro |
| 145 |     |     |     | 150 |     |     |     |     |     | 155 |     |     |     | 160 |     |
| Thr | Thr | Tyr | Ser | Val | Thr | Ile | Ala | Glu | Ser | Thr | Pro | Leu | Arg | Thr | Ser |
|     |     |     | 165 |     |     |     |     |     | 170 |     |     |     |     | 175 |     |

Val Ala Gln Val Thr Ala Thr Asp Ala Asp Ile Gly Ser Asn Gly Glu  
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Phe Tyr Tyr Tyr Phe Lys Asn Lys Val Asp Leu Phe Ser Val His Pro  
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Thr Ser Gly Val Ile Ser Leu Ser Gly Arg Leu Asn Tyr Asp Glu Lys  
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Tyr Gly Asn Asn Gly Val Ser Ser Thr Ala Lys Leu Tyr Val His Ile  
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Glu Arg Ile Asn Glu His Ala Pro Thr Ile His Val Val Thr His Val  
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Ala Gly Asp Pro Leu Asp Gln Phe Phe Leu Ala Lys Glu Gly Lys Trp  
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Ser Asp Lys Asp Lys Gly Glu Asn Gly Tyr Ile Thr Tyr Ser Ile Ala  
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Ser Leu Asn Leu Leu Pro Phe Val Ile Asn Gln Phe Thr Gly Val Ile  
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|      |      |      |      |     |      |      |      |     |      |      |      |      |      |      |     |  |
|------|------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|-----|--|
| Val  | Leu  | Met  | Pro  | Met | Asp  | Arg  | Glu  | His | Thr  | Asp  | Leu  | Tyr  | Leu  | Leu  | Asn |  |
| 785  |      |      |      |     | 790  |      |      |     |      | 795  |      |      |      |      | 800 |  |
| Ile  | Thr  | Ile  | Tyr  | Asp | Leu  | Gly  | Asn  | Pro | Gln  | Lys  | Ser  | Ser  | Trp  | Arg  | Leu |  |
|      |      |      |      | 805 |      |      |      |     | 810  |      |      |      |      | 815  |     |  |
| Leu  | Thr  | Ile  | Asn  | Val | Glu  | Asp  | Ala  | Asn | Asp  | Asn  | Ser  | Pro  | Val  | Phe  | Ile |  |
|      |      |      | 820  |     |      |      |      | 825 |      |      |      |      | 830  |      |     |  |
| Gln  | Asp  | Ser  | Tyr  | Ser | Val  | Asn  | Ile  | Leu | Glu  | Ser  | Ser  | Gly  | Ile  | Gly  | Thr |  |
|      |      | 835  |      |     |      |      | 840  |     |      |      |      | 845  |      |      |     |  |
| Glu  | Ile  | Ile  | Gln  | Val | Glu  | Ala  | Arg  | Asp | Lys  | Asp  | Leu  | Gly  | Ser  | Asn  | Gly |  |
|      | 850  |      |      |     |      | 855  |      |     |      |      | 860  |      |      |      |     |  |
| Glu  | Val  | Thr  | Tyr  | Ser | Val  | Leu  | Thr  | Asp | Thr  | Gln  | Gln  | Phe  | Ala  | Ile  | Asn |  |
| 865  |      |      |      |     | 870  |      |      |     |      | 875  |      |      |      |      | 880 |  |
| Ser  | Ser  | Thr  | Gly  | Ile | Val  | Tyr  | Val  | Ala | Asp  | Gln  | Leu  | Asp  | Arg  | Glu  | Ser |  |
|      |      |      |      | 885 |      |      |      |     | 890  |      |      |      |      | 895  |     |  |
| Lys  | Ala  | Asn  | Tyr  | Ser | Leu  | Lys  | Ile  | Glu | Ala  | Arg  | Asp  | Lys  | Ala  | Glu  | Ser |  |
|      |      | 900  |      |     |      |      |      | 905 |      |      |      |      | 910  |      |     |  |
| Gly  | Gln  | Gln  | Leu  | Phe | Ser  | Val  | Val  | Thr | Leu  | Lys  | Val  | Phe  | Leu  | Asp  | Asp |  |
|      | 915  |      |      |     |      |      | 920  |     |      |      |      | 925  |      |      |     |  |
| Val  | Asn  | Asp  | Cys  | Ser | Pro  | Ala  | Phe  | Ile | Pro  | Ser  | Ser  | Tyr  | Ser  | Val  | Lys |  |
|      | 930  |      |      |     |      | 935  |      |     |      |      | 940  |      |      |      |     |  |
| Val  | Leu  | Glu  | Asp  | Leu | Pro  | Val  | Gly  | Thr | Val  | Ile  | Ala  | Trp  | Leu  | Glu  | Thr |  |
| 945  |      |      |      |     | 950  |      |      |     |      | 955  |      |      |      |      | 960 |  |
| His  | Asp  | Pro  | Asp  | Leu | Gly  | Leu  | Gly  | Gly | Gln  | Val  | Arg  | Tyr  | Ser  | Leu  | Val |  |
|      |      |      |      | 965 |      |      |      | 970 |      |      |      |      |      | 975  |     |  |
| Asn  | Asp  | Tyr  | Asn  | Gly | Arg  | Phe  | Glu  | Ile | Asp  | Lys  | Ala  | Ser  | Gly  | Ala  | Ile |  |
|      |      |      | 980  |     |      |      |      | 985 |      |      |      |      | 990  |      |     |  |
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|      |      | 995  |      |     |      |      | 1000 |     |      |      |      | 1005 |      |      |     |  |
| Thr  | Val  | Arg  | Ala  | Lys | Asp  | Lys  | Gly  | Arg | Pro  | Val  | Ser  | Leu  | Ser  | Ser  | Val |  |
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| Ser  | Phe  | Val  | Glu  | Val | Glu  | Val  | Val  | Asp | Val  | Asn  | Glu  | Asn  | Leu  | His  | Thr |  |
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| Pro  | Tyr  | Phe  | Pro  | Asp | Phe  | Ala  | Val  | Val | Gly  | Ser  | Val  | Lys  | Glu  | Asn  | Ser |  |
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Val Ala Ile Val Asn Ala Val Gly Asn Arg Leu Asn Glu Pro Leu Lys  
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Lys Asp Gly Gly Lys Pro Ser Leu Ser Thr Ser Val Glu Leu Pro Ile  
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Thr Ile Val Asn Lys Ala Met Pro Val Phe Asp Lys Pro Phe Tyr Thr  
2180 2185 2190  
Ala Ser Val Asn Glu Asp Ile Arg Met Asn Thr Pro Ile Leu Ser Ile  
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Pro Val Leu Gln Val Val Ser Ile Asp Ala Asp Ser Glu Asn Asn Lys  
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| Met | His | Gln | Phe | Thr | Ile | Val | Ser | Phe | His | Pro | Ser | Arg | Arg | Leu | His | 1   | 5   | 10  | 15  |
| Arg | Asn | Arg | Glu | Asp | Tyr | Val | Glu | Arg | Ser | Ala | Glu | Phe | Ala | Asp | Gly | 20  | 25  | 30  |     |
| Leu | Leu | Ser | Lys | Ala | Leu | Lys | Asp | Ile | Gln | Ser | Gly | Ala | Leu | Asp | Ile | 35  | 40  | 45  |     |
| Asn | Lys | Ala | Gly | Ile | Leu | Tyr | Gly | Ile | Pro | Gln | Lys | Thr | Leu | Leu | Leu | 50  | 55  | 60  |     |
| His | Leu | Glu | Ala | Leu | Pro | Ala | Gly | Lys | Pro | Ala | Ser | Phe | Lys | Asn | Lys | 65  | 70  | 75  | 80  |
| Thr | Arg | Asp | Phe | His | Asp | Ser | Tyr | Ser | Tyr | Lys | Asp | Ser | Lys | Glu | Thr | 85  | 90  | 95  |     |
| Cys | Ala | Val | Leu | Gln | Lys | Val | Ala | Leu | Trp | Ala | Arg | Ala | Gln | Ala | Glu | 100 | 105 | 110 |     |
| Arg | Thr | Glu | Lys | Ser | Lys | Leu | Asn | Leu | Leu | Glu | Thr | Ser | Glu | Ile | Lys | 115 | 120 | 125 |     |
| Phe | Pro | Thr | Ala | Ser | Thr | Tyr | Leu | His | Gln | Leu | Thr | Leu | Gln | Lys | Met | 130 | 135 | 140 |     |
| Val | Thr | Gln | Phe | Lys | Glu | Lys | Asn | Glu | Ser | Leu | Gln | Tyr | Glu | Thr | Ser | 145 | 150 | 155 | 160 |
| Asn | Pro | Thr | Val | Gln | Leu | Lys | Ile | Pro | Gln | Leu | Arg | Val | Ser | Ser | Val | 165 | 170 | 175 |     |
| Ser | Lys | Ser | Gln | Pro | Asp | Gly | Ser | Gly | Leu | Leu | Asp | Val | Met | Tyr | Gln | 180 | 185 | 190 |     |
| Val | Ser | Lys | Thr | Ser | Ser | Val | Leu | Glu | Gly | Ser | Ala | Leu | Gln | Lys | Leu | 195 | 200 | 205 |     |
| Lys | Asn | Ile | Leu | Pro | Lys | Gln | Asn | Lys | Ile | Glu | Cys | Ser | Gly | Pro | Val | 210 | 215 | 220 |     |
| Thr | His | Ser | Ser | Val | Asp | Ser | Tyr | Phe | Leu | His | Gly | Asp | Leu | Ser | Pro | 225 | 230 | 235 | 240 |
| Leu | Cys | Leu | Asn | Ser | Lys | Asn | Gly | Thr | Val | Asp | Gly | Thr | Ser | Glu | Asn | 245 | 250 | 255 |     |
| Thr | Glu | Asp | Gly | Leu | Asp | Arg | Lys | Asp | Ser | Lys | Gln | Pro | Arg | Lys | Lys | 260 | 265 | 270 |     |
| Arg | Gly | Arg | Tyr | Arg | Gln | Tyr | Asp | His | Glu | Ile | Met | Glu | Glu | Ala | Ile | 275 | 280 | 285 |     |
| Ala | Met | Val | Met | Ser | Gly | Lys | Met | Ser | Val | Ser | Lys | Ala | Gln | Gly | Ile | 290 | 295 | 300 |     |

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Thr Val Ser Pro Asn Leu Arg Pro Val Asn Glu Lys Leu Glu Ala Tyr
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Ile Leu Asp Pro Arg Gly Ser Arg Met Ile Glu Trp Arg His Leu Lys

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| Tyr Asn Lys Ser Phe Glu Val Gln Lys Tyr Val Leu Pro Lys Phe Glu |     |         |
|   | 260 | 265 270 |
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|   | 275 | 280 285 |
| Thr Gly Thr Val Arg Ala Arg Tyr Thr Phe Gly Lys Pro Val Ala Gly |     |         |
|   | 290 | 295 300 |
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| Glu Val Gly Arg Pro Val Leu Arg Thr Thr Lys Ile Leu Gly Ser Arg |     |         |
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| Thr Lys Val Met Ala Leu Asn Gly Lys Pro Val Gly Ala Gln Tyr Leu |     |         |
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| Leu Gln Leu Gln Pro Pro Ser His Pro Leu Gln Val Gly Glu Glu Ala |     |         |
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| Tyr Phe Ser Val Lys Ser Thr Cys Pro Cys Asn Phe Thr Leu Tyr Tyr |     |         |

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| Pro Ile Arg Leu Thr His Leu Ser Glu Thr Glu Pro Pro Pro Ala Pro<br>565 570 575     |     |     |
| Glu Ala Glu Val Asp Val Cys Val Thr Ser Leu His Leu Ala Val Thr<br>580 585 590     |     |     |
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| Cys Val Ala Ala Val Asp Lys Ser Val Tyr Leu Leu Arg Ser Gly Phe<br>660 665 670     |     |     |
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| Trp Gly Ile Thr Lys Asp Ser Gly Phe Ala Phe Thr Glu Thr Gly Leu<br>725 730 735     |     |     |
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| Leu Tyr Thr Asp Glu Ala Val Pro Ala Phe Gln Pro His Thr Gly Ser<br>755 760 765     |     |     |
| Leu Val Ala Val Ala Pro Ser Arg His Pro Pro Arg Thr Glu Lys Arg<br>770 775 780     |     |     |
| Lys Arg Thr Phe Phe Pro Glu Thr Trp Ile Trp His Cys Leu Asn Ile<br>785 790 795 800 |     |     |
| Ser Asp Pro Ser Gly Glu Gly Thr Leu Ser Val Lys Val Pro Asp Ser<br>805 810 815     |     |     |
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|     |      |      |      | 885 |     |      |      |     | 890  |     |      |      |      | 895 |      |
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| Arg | Ser  | Ser  | Lys  | His | Pro | Glu  | Glu  | Asn | His  | Ala | Asp  | Arg  | Arg  | Val | Pro  |
|     | 945  |      |      |     |     | 950  |      |     |      |     | 955  |      |      |     | 960  |
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|     |      |      |      | 965 |     |      |      |     | 970  |     |      |      |      | 975 |      |
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| Val | His  | Ile  | Ser  | Thr | Pro | Asn  | Lys  | Tyr | Glu  | Phe | Gln  | Tyr  | Val  | Gln | Arg  |
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|     | 1075 |      |      |     |     | 1080 |      |     |      |     |      | 1085 |      |     |      |
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|     | 1090 |      |      |     |     | 1095 |      |     |      |     | 1100 |      |      |     |      |
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| Met Gly Pro Thr Leu Asn His Leu Asn Asn Leu Leu Arg Leu Pro Phe<br>1170 1175 1180      |      |      |
| Gly Cys Gly Glu Gln Asn Met Ile His Phe Ala Pro Asn Val Phe Val<br>1185 1190 1195 1200 |      |      |
| Leu Lys Tyr Leu Gln Lys Thr Gln Gln Leu Ser Pro Glu Val Glu Arg<br>1205 1210 1215      |      |      |
| Glu Thr Thr Asp Tyr Leu Val Gln Gly Tyr Gln Arg Gln Leu Thr Tyr<br>1220 1225 1230      |      |      |
| Lys Arg Gln Asp Gly Ser Tyr Ser Ala Phe Gly Glu Arg Asp Ala Ser<br>1235 1240 1245      |      |      |
| Gly Ser Met Trp Leu Thr Ala Phe Val Leu Lys Ser Phe Ala Gln Ala<br>1250 1255 1260      |      |      |
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| Glu Glu Glu Arg Gly Ser Thr Asp Lys Ala Arg His Phe Leu Glu Ser<br>1330 1335 1340      |      |      |
| Ala Ala Pro Leu Ala Met Asp Pro Tyr Ser Cys Ala Leu Thr Thr Tyr<br>1345 1350 1355 1360 |      |      |
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| Arg Val Ser Gln Ser Val Val Ser Ala Glu Val Glu Met Thr Ala Tyr<br>1410 1415 1420      |      |      |
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| Ser Thr Gln Asp Thr Cys Val Ala Leu Gln Ala Leu Ala Glu Tyr Ala | 1460 | 1465 | 1470 |
| Ile Leu Ser Tyr Ala Gly Gly Ile Asn Leu Thr Val Ser Leu Ala Ser | 1475 | 1480 | 1485 |
| Thr Asn Leu Asp Tyr Gln Glu Thr Phe Glu Leu His Arg Thr Asn Gln | 1490 | 1495 | 1500 |
| Lys Val Leu Gln Thr Ala Ala Ile Pro Ser Leu Pro Thr Gly Leu Phe | 1505 | 1510 | 1515 |
| Val Ser Ala Lys Gly Asp Gly Cys Cys Leu Met Gln Ile Asp Val Thr | 1525 | 1530 | 1535 |
| Tyr Asn Val Pro Asp Pro Val Ala Lys Pro Ala Phe Gln Leu Leu Val | 1540 | 1545 | 1550 |
| Ser Leu Gln Glu Pro Glu Ala Gln Gly Arg Pro Pro Pro Met Pro Ala | 1555 | 1560 | 1565 |
| Ser Ala Ala Glu Gly Ser Arg Gly Asp Trp Pro Pro Ala Asp Asp Asp | 1570 | 1575 | 1580 |
| Asp Pro Ala Ala Asp Gln His His Gln Glu Tyr Lys Val Met Leu Glu | 1585 | 1590 | 1595 |
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| Glu Val Pro Leu Leu Ser Gly Phe Arg Ala Asp Ile Glu Ser Leu Glu | 1620 | 1625 | 1630 |
| Gln Leu Leu Leu Asp Lys His Met Gly Met Lys Arg Tyr Glu Val Ala | 1635 | 1640 | 1645 |
| Gly Arg Arg Val Leu Phe Tyr Phe Asp Glu Ile Pro Ser Arg Cys Leu | 1650 | 1655 | 1660 |
| Thr Cys Val Arg Phe Arg Ala Leu Arg Glu Cys Val Val Gly Arg Thr | 1665 | 1670 | 1675 |
| Ser Ala Leu Pro Val Ser Val Tyr Asp Tyr Tyr Glu Pro Ala Phe Glu | 1685 | 1690 | 1695 |
| Ala Thr Arg Phe Tyr Asn Val Ser Thr His Ser Pro Leu Ala Arg Glu | 1700 | 1705 | 1710 |
| Leu Cys Ala Gly Pro Ala Cys Asn Glu Val Glu Arg Ala Pro Ala Arg | 1715 | 1720 | 1725 |
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| Ser Ser Thr Tyr Gly Asp Asp Leu Ala Ser Val Ala Pro Gly Pro Leu |      |           |
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| Gln Gln Asp Val Lys Leu Asn Gly Ala Gly Leu Glu Val Glu Asp Ser |      |           |
| 1825  | 1830 | 1835 1840 |
| Asp Pro Glu Pro Glu Gly Glu Ala Glu Asp Arg Val Thr Ala Gly Pro |      |           |
|   | 1845 | 1850 1855 |
| Arg Pro Pro Val Ser Ser Gly Asn Leu Glu Ser Ser Thr Gln Ser Ala |      |           |
|   | 1860 | 1865 1870 |
| Ser Pro Phe His Arg Trp Gly Gln Thr Pro Ala Pro Gln Arg His Ser |      |           |
|   | 1875 | 1880 1885 |
| Gly Arg Val Val Gly Ala His Arg Pro Gly Leu Leu Ser Pro Val Phe |      |           |
|   | 1890 | 1895 1900 |
| Val Tyr Ser Pro Ala Phe Gln Ser Gly Gly Glu Glu Gly Leu Trp Met |      |           |
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|     |     | 130 |     |     |     | 135 |     |     |     |     |     | 140 |     |     |     |  |
| Val | Leu | Ile | Ser | Ile | Phe | Thr | Val | Ser | Pro | Asn | Leu | Arg | Pro | Val | Asn |  |
| 145 |     |     |     |     | 150 |     |     |     |     |     | 155 |     |     | 160 |     |  |
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|     |     |     | 165 |     |     |     |     |     | 170 |     |     | 175 |     |     |     |  |
| Glu | Trp | Arg | His | Leu | Lys | Pro | Phe | Cys | Cys | Gly | Ile | Thr | Asn | Met | Ser |  |
|     |     |     | 180 |     |     |     |     |     | 185 |     |     | 190 |     |     |     |  |
| Phe | Pro | Leu | Ser | Asp | Gln | Pro | Val | Leu | Gly | Glu | Trp | Phe | Ile | Phe | Val |  |
|     |     | 195 |     |     |     |     |     | 200 |     |     |     |     |     | 205 |     |  |
| Glu | Met | Gln | Gly | His | Ala | Tyr | Asn | Lys | Ser | Phe | Glu | Val | Gln | Lys | Tyr |  |
| 210 |     |     |     |     | 215 |     |     |     |     |     | 220 |     |     |     |     |  |
| Val | Leu | Pro | Lys | Phe | Glu | Leu | Leu | Ile | Asp | Pro | Pro | Arg | Tyr | Ile | Gln |  |
| 225 |     |     |     |     | 230 |     |     |     |     |     | 235 |     |     | 240 |     |  |
| Asp | Leu | Asp | Ala | Cys | Glu | Thr | Gly | Thr | Val | Arg | Ala | Arg | Tyr | Thr | Phe |  |
|     |     |     | 245 |     |     |     |     |     | 250 |     |     | 255 |     |     |     |  |
| Gly | Lys | Pro | Val | Ala | Gly | Ala | Leu | Met | Ile | Asn | Met | Thr | Val | Asn | Gly |  |
|     |     | 260 |     |     |     |     |     | 265 |     |     |     |     |     | 270 |     |  |
| Val | Gly | Tyr | Tyr | Ser | His | Glu | Val | Gly | Arg | Pro | Val | Leu | Arg | Thr | Thr |  |
|     |     | 275 |     |     |     |     |     | 280 |     |     | 285 |     |     |     |     |  |
| Lys | Ile | Leu | Gly | Ser | Arg | Asp | Phe | Asp | Ile | Cys | Val | Arg | Asp | Met | Ile |  |
| 290 |     |     |     |     | 295 |     |     |     |     |     | 300 |     |     |     |     |  |
| Pro | Ala | Asp | Val | Pro | Glu | His | Phe | Arg | Gly | Arg | Val | Ser | Ile | Trp | Ala |  |
| 305 |     |     |     |     | 310 |     |     |     |     |     | 315 |     |     | 320 |     |  |
| Met | Val | Thr | Ser | Val | Asp | Gly | Ser | Gln | Gln | Val | Ala | Phe | Asp | Asp | Ser |  |
|     |     |     | 325 |     |     |     |     |     | 330 |     |     | 335 |     |     |     |  |
| Thr | Pro | Val | Gln | Arg | Gln | Leu | Val | Asp | Ile | Arg | Tyr | Ser | Lys | Asp | Thr |  |
|     |     |     | 340 |     |     |     |     |     | 345 |     |     | 350 |     |     |     |  |
| Arg | Lys | Gln | Phe | Lys | Pro | Gly | Leu | Ala | Tyr | Val | Gly | Lys | Val | Glu | Leu |  |
|     |     | 355 |     |     |     |     |     | 360 |     |     | 365 |     |     |     |     |  |
| Ser | Tyr | Pro | Asp | Gly | Ser | Pro | Ala | Glu | Gly | Val | Thr | Val | Gln | Ile | Lys |  |
| 370 |     |     |     |     | 375 |     |     |     |     |     | 380 |     |     |     |     |  |
| Ala | Glu | Leu | Thr | Pro | Lys | Asp | Asn | Ile | Tyr | Thr | Ser | Glu | Val | Val | Ser |  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 385 |     |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     | 400 |
| Gln | Arg | Gly | Leu | Val | Gly | Phe | Glu | Ile | Pro | Ser | Ile | Pro | Thr | Ser | Ala |
|     |     |     |     | 405 |     |     |     |     | 410 |     |     |     |     | 415 |     |
| Gln | His | Val | Trp | Leu | Glu | Thr | Lys | Val | Met | Ala | Leu | Asn | Gly | Lys | Pro |
|     |     |     | 420 |     |     |     |     | 425 |     |     |     |     | 430 |     |     |
| Val | Gly | Ala | Gln | Tyr | Leu | Pro | Ser | Tyr | Leu | Ser | Leu | Gly | Ser | Trp | Tyr |
|     |     | 435 |     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |
| Ser | Pro | Ser | Gln | Cys | Tyr | Leu | Gln | Leu | Gln | Pro | Pro | Ser | His | Pro | Leu |
|     | 450 |     |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     |
| Gln | Val | Gly | Glu | Glu | Ala | Tyr | Phe | Ser | Val | Lys | Ser | Thr | Cys | Pro | Cys |
| 465 |     |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |
| Asn | Phe | Thr | Leu | Tyr | Tyr | Glu | Val | Ala | Ala | Arg | Gly | Asn | Ile | Val | Leu |
|     |     |     | 485 |     |     |     |     |     | 490 |     |     |     |     | 495 |     |
| Ser | Gly | Gln | Gln | Pro | Ala | His | Thr | Thr | Gln | Gln | Arg | Ser | Lys | Arg | Ala |
|     |     |     | 500 |     |     |     |     | 505 |     |     |     |     | 510 |     |     |
| Ala | Pro | Ala | Leu | Glu | Lys | Pro | Ile | Arg | Leu | Thr | His | Leu | Ser | Glu | Thr |
|     |     | 515 |     |     |     |     | 520 |     |     |     |     | 525 |     |     |     |
| Glu | Pro | Pro | Pro | Ala | Pro | Glu | Ala | Glu | Val | Asp | Val | Cys | Val | Thr | Ser |
|     | 530 |     |     |     |     | 535 |     |     |     |     | 540 |     |     |     |     |
| Leu | His | Leu | Ala | Val | Thr | Pro | Ser | Met | Val | Pro | Leu | Gly | Arg | Leu | Leu |
| 545 |     |     |     |     | 550 |     |     |     |     | 555 |     |     |     |     | 560 |
| Val | Phe | Tyr | Val | Arg | Glu | Asn | Gly | Glu | Gly | Val | Ala | Asp | Ser | Leu | Gln |
|     |     |     | 565 |     |     |     |     | 570 |     |     |     |     |     | 575 |     |
| Phe | Ala | Val | Glu | Thr | Phe | Phe | Glu | Asn | Gln | Val | Ser | Val | Thr | Tyr | Ser |
|     |     | 580 |     |     |     |     | 585 |     |     |     |     |     | 590 |     |     |
| Ala | Asn | Glu | Thr | Gln | Pro | Gly | Glu | Val | Val | Asp | Leu | Arg | Ile | Arg | Ala |
|     |     | 595 |     |     |     |     | 600 |     |     |     |     | 605 |     |     |     |
| Ala | Arg | Gly | Ser | Cys | Val | Cys | Val | Ala | Ala | Val | Asp | Lys | Ser | Val | Tyr |
|     | 610 |     |     |     |     | 615 |     |     |     |     | 620 |     |     |     |     |
| Leu | Leu | Arg | Ser | Gly | Phe | Arg | Leu | Thr | Pro | Ala | Gln | Val | Phe | Gln | Glu |
| 625 |     |     |     |     | 630 |     |     |     |     | 635 |     |     |     |     | 640 |
| Leu | Glu | Asp | Tyr | Asp | Val | Ser | Asp | Ser | Phe | Gly | Val | Ser | Arg | Glu | Asp |
|     |     |     | 645 |     |     |     |     | 650 |     |     |     |     |     | 655 |     |
| Gly | Pro | Phe | Trp | Trp | Ala | Gly | Leu | Thr | Ala | Gln | Arg | Arg | Arg | Arg | Ser |
|     |     |     | 660 |     |     |     |     | 665 |     |     |     |     | 670 |     |     |
| Ser | Val | Phe | Pro | Trp | Pro | Trp | Gly | Ile | Thr | Lys | Asp | Ser | Gly | Phe | Ala |
|     |     | 675 |     |     |     |     | 680 |     |     |     |     | 685 |     |     |     |
| Phe | Thr | Glu | Thr | Gly | Leu | Val | Val | Met | Thr | Asp | Arg | Val | Ser | Leu | Asn |

| 690        |     |            |            |            | 695        |            |            |            |            | 700        |            |            |            |     |            |
|------------|-----|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-----|------------|
| His<br>705 | Arg | Gln        | Asp        | Gly        | Gly<br>710 | Leu        | Tyr        | Thr        | Asp        | Glu<br>715 | Ala        | Val        | Pro        | Ala | Phe<br>720 |
| Gln        | Pro | His        | Thr        | Gly<br>725 | Ser        | Leu        | Val        | Ala        | Val<br>730 | Ala        | Pro        | Ser        | Arg        | His | Pro<br>735 |
| Pro        | Arg | Thr        | Glu<br>740 | Lys        | Arg        | Lys        | Arg        | Thr        | Phe<br>745 | Phe        | Pro        | Glu        | Thr        | Trp | Ile<br>750 |
| Trp        | His | Cys<br>755 | Leu        | Asn        | Ile        | Ser        | Asp<br>760 | Pro        | Ser        | Gly        | Glu        | Gly        | Thr        | Leu | Ser<br>765 |
| Val<br>770 | Lys | Val        | Pro        | Asp        | Ser        | Ile<br>775 | Thr        | Ser        | Trp        | Val        | Gly<br>780 | Glu        | Ala        | Val | Ala        |
| Leu<br>785 | Ser | Thr        | Ser        | Gln        | Gly<br>790 | Leu        | Gly        | Ile        | Ala        | Glu<br>795 | Pro        | Ser        | Leu        | Leu | Lys<br>800 |
| Thr        | Phe | Lys        | Pro        | Phe<br>805 | Phe        | Val        | Asp        | Phe        | Met<br>810 | Leu        | Pro        | Ala        | Leu        | Ile | Ile<br>815 |
| Arg        | Gly | Glu        | Gln<br>820 | Val        | Lys        | Ile        | Pro        | Leu        | Ser<br>825 | Val        | Tyr        | Asn        | Tyr        | Met | Gly<br>830 |
| Thr        | Cys | Ala<br>835 | Glu        | Val        | Tyr        | Met        | Lys<br>840 | Leu        | Ser        | Val        | Pro        | Lys<br>845 | Gly        | Ile | Gln        |
| Phe<br>850 | Val | Gly        | His        | Pro        | Gly        | Lys<br>855 | Arg        | His        | Val        | Thr        | Lys<br>860 | Lys        | Met        | Cys | Val        |
| Ala<br>865 | Pro | Gly        | Glu        | Ala        | Glu<br>870 | Pro        | Ile        | Trp        | Val        | Val<br>875 | Leu        | Ser        | Phe        | Ser | Asp<br>880 |
| Leu        | Gly | Leu        | Asn        | Asn<br>885 | Ile        | Thr        | Ala        | Lys        | Ala<br>890 | Leu        | Ala        | Tyr        | Gly        | Asp | Thr<br>895 |
| Asn        | Cys | Cys        | Arg        | Asp<br>900 | Gly        | Arg        | Ser        | Ser<br>905 | Lys        | His        | Pro        | Glu        | Glu        | Asn | His<br>910 |
| Ala        | Asp | Arg<br>915 | Arg        | Val        | Pro        | Ile        | Gly<br>920 | Val        | Asp        | His        | Val        | Arg<br>925 | Arg        | Ser | Val        |
| Met<br>930 | Val | Glu        | Ala        | Glu        | Gly<br>935 | Val        | Pro        | Arg        | Ala        | Tyr        | Thr<br>940 | Tyr        | Ser        | Ala | Phe        |
| Phe<br>945 | Cys | Pro        | Ser        | Glu        | Arg<br>950 | Val        | His        | Ile        | Ser        | Thr<br>955 | Pro        | Asn        | Lys        | Tyr | Glu<br>960 |
| Phe        | Gln | Tyr        | Val        | Gln<br>965 | Arg        | Pro        | Leu        | Arg        | Leu<br>970 | Thr        | Arg        | Phe        | Asp        | Val | Ala<br>975 |
| Val        | Arg | Ala        | His        | Asn<br>980 | Asp        | Ala        | Arg        | Val<br>985 | Ala        | Leu        | Ser        | Ser        | Gly<br>990 | Pro | Gln        |
| Asp        | Thr | Ala        | Gly        | Met        | Ile        | Glu        | Ile        | Val        | Leu        | Gly        | Gly        | His        | Gln        | Asn | Thr        |

|   |      |                |
|---|------|----------------|
| 995   | 1000 | 1005           |
| Arg Ser Trp Ile Ser Thr Ser Lys Met Gly Glu Pro Val Ala Ser Ala |      |                |
| 1010  | 1015 | 1020           |
| His Thr Ala Lys Ile Leu Ser Trp Asp Glu Phe Arg Thr Phe Trp Ile |      |                |
| 1025  | 1030 | 1035 1040      |
| Ser Trp Arg Gly Gly Leu Ile Gln Val Gly His Gly Pro Glu Pro Ser |      |                |
|   | 1045 | 1050 1055      |
| Asn Glu Ser Val Ile Val Ala Trp Thr Leu Pro Arg Pro Pro Glu Val |      |                |
|   | 1060 | 1065 1070      |
| Gln Phe Ile Gly Phe Ser Thr Gly Trp Gly Ser Met Gly Glu Phe Arg |      |                |
|   | 1075 | 1080 1085      |
| Ile Trp Arg Lys Met Glu Val Asp Glu Ser Tyr Ser Glu Ala Phe Thr |      |                |
|   | 1090 | 1095 1100      |
| Leu Gly Val Pro His Gly Ala Ile Pro Gly Ser Glu Arg Ala Thr Ala |      |                |
|   | 1105 | 1110 1115 1120 |
| Ser Ile Ile Gly Asp Val Met Gly Pro Thr Leu Asn His Leu Asn Asn |      |                |
|   | 1125 | 1130 1135      |
| Leu Leu Arg Leu Pro Phe Gly Cys Gly Glu Gln Asn Met Ile His Phe |      |                |
|   | 1140 | 1145 1150      |
| Ala Pro Asn Val Phe Val Leu Lys Tyr Leu Gln Lys Thr Gln Gln Leu |      |                |
|   | 1155 | 1160 1165      |
| Ser Pro Glu Val Glu Arg Glu Thr Thr Asp Tyr Leu Val Gln Gly Tyr |      |                |
|   | 1170 | 1175 1180      |
| Gln Arg Gln Leu Thr Tyr Lys Arg Gln Asp Gly Ser Tyr Ser Ala Phe |      |                |
|   | 1185 | 1190 1195 1200 |
| Gly Glu Arg Asp Ala Ser Gly Ser Met Trp Leu Thr Ala Phe Val Leu |      |                |
|   | 1205 | 1210 1215      |
| Lys Ser Phe Ala Gln Ala Arg Ser Phe Ile Phe Val Asp Pro Arg Glu |      |                |
|   | 1220 | 1225 1230      |
| Leu Ala Ala Ala Lys Ser Trp Ile Ile Gln Gln Gln Gln Ala Asp Gly |      |                |
|   | 1235 | 1240 1245      |
| Ser Phe Leu Ala Val Gly Arg Val Leu Asn Lys Asp Ile Gln Gly Gly |      |                |
|   | 1250 | 1255 1260      |
| Ile His Gly Ile Val Pro Leu Thr Ala Tyr Val Val Val Ala Leu Leu |      |                |
|   | 1265 | 1270 1275 1280 |
| Glu Thr Gly Thr Ala Ser Glu Glu Glu Arg Gly Ser Thr Asp Lys Ala |      |                |
|   | 1285 | 1290 1295      |
| Arg His Phe Leu Glu Ser Ala Ala Pro Leu Ala Met Asp Pro Tyr Ser |      |                |

| 1300   | 1305 | 1310 |
|--|------|------|
| Cys Ala Leu Thr Thr Tyr Ala Leu Thr Leu Leu Arg Ser Pro Ala Ala<br>1315 1320 1325      |      |      |
| Pro Glu Ala Leu Arg Lys Leu Arg Ser Leu Ala Ile Met Arg Asp Gly<br>1330 1335 1340      |      |      |
| Val Thr His Trp Ser Leu Ser Asn Ser Trp Asp Val Asp Lys Gly Thr<br>1345 1350 1355 1360 |      |      |
| Phe Leu Ser Phe Ser Asp Arg Val Ser Gln Ser Val Val Ser Ala Glu<br>1365 1370 1375      |      |      |
| Val Glu Met Thr Ala Tyr Ala Leu Leu Thr Tyr Thr Leu Leu Gly Asp<br>1380 1385 1390      |      |      |
| Val Ala Ala Ala Leu Pro Val Val Lys Trp Leu Ser Gln Gln Arg Asn<br>1395 1400 1405      |      |      |
| Ala Leu Gly Gly Phe Ser Ser Thr Gln Asp Thr Cys Val Ala Leu Gln<br>1410 1415 1420      |      |      |
| Ala Leu Ala Glu Tyr Ala Ile Leu Ser Tyr Ala Gly Gly Ile Asn Leu<br>1425 1430 1435 1440 |      |      |
| Thr Val Ser Leu Ala Ser Thr Asn Leu Asp Tyr Gln Glu Thr Phe Glu<br>1445 1450 1455      |      |      |
| Leu His Arg Thr Asn Gln Lys Val Leu Gln Thr Ala Ala Ile Pro Ser<br>1460 1465 1470      |      |      |
| Leu Pro Thr Gly Leu Phe Val Ser Ala Lys Gly Asp Gly Cys Cys Leu<br>1475 1480 1485      |      |      |
| Met Gln Ile Asp Val Thr Tyr Asn Val Pro Asp Pro Val Ala Lys Pro<br>1490 1495 1500      |      |      |
| Ala Phe Gln Leu Leu Val Ser Leu Gln Glu Pro Glu Ala Gln Gly Arg<br>1505 1510 1515 1520 |      |      |
| Pro Pro Pro Met Pro Ala Ser Ala Ala Glu Gly Ser Arg Gly Asp Trp<br>1525 1530 1535      |      |      |
| Pro Pro Ala Asp Asp Asp Asp Pro Ala Ala Asp Gln His His Gln Glu<br>1540 1545 1550      |      |      |
| Tyr Lys Val Met Leu Glu Val Cys Thr Arg Trp Leu His Ala Gly Ser<br>1555 1560 1565      |      |      |
| Ser Asn Met Ala Val Leu Glu Val Pro Leu Leu Ser Gly Phe Arg Ala<br>1570 1575 1580      |      |      |
| Asp Ile Glu Ser Leu Glu Gln Leu Leu Leu Asp Lys His Met Gly Met<br>1585 1590 1595 1600 |      |      |
| Lys Arg Tyr Glu Val Ala Gly Arg Arg Val Leu Phe Tyr Phe Asp Glu                        |      |      |

|   |      |      |
|---|------|------|
| 1605  | 1610 | 1615 |
| Ile Pro Ser Arg Cys Leu Thr Cys Val Arg Phe Arg Ala Leu Arg Glu |      |      |
| 1620  | 1625 | 1630 |
| Cys Val Val Gly Arg Thr Ser Ala Leu Pro Val Ser Val Tyr Asp Tyr |      |      |
| 1635  | 1640 | 1645 |
| Tyr Glu Pro Ala Phe Glu Ala Thr Arg Phe Tyr Asn Val Ser Thr His |      |      |
| 1650  | 1655 | 1660 |
| Ser Pro Leu Ala Arg Glu Leu Cys Ala Gly Pro Ala Cys Asn Glu Val |      |      |
| 1665  | 1670 | 1675 |
| Glu Arg Ala Pro Ala Arg Gly Pro Gly Trp Phe Pro Gly Glu Ser Gly |      |      |
| 1685  | 1690 | 1695 |
| Pro Ala Val Ala Pro Glu Glu Gly Ala Ala Ile Ala Arg Cys Gly Cys |      |      |
| 1700  | 1705 | 1710 |
| Asp His Asp Cys Gly Ala Gln Gly Asn Pro Val Cys Gly Ser Asp Gly |      |      |
| 1715  | 1720 | 1725 |
| Val Val Tyr Ala Ser Ala Cys Arg Leu Arg Glu Ala Ala Cys Arg Gln |      |      |
| 1730  | 1735 | 1740 |
| Ala Ala Pro Leu Glu Pro Ala Pro Pro Ser Cys Cys Ala Leu Glu Gln |      |      |
| 1745  | 1750 | 1755 |
| Arg Leu Pro Ala Ser Ser Ser Ser Thr Tyr Gly Asp Asp Leu Ala Ser |      |      |
| 1765  | 1770 | 1775 |
| Val Ala Pro Gly Pro Leu Gln Gln Asp Val Lys Leu Asn Gly Ala Gly |      |      |
| 1780  | 1785 | 1790 |
| Leu Glu Val Glu Asp Ser Asp Pro Glu Pro Glu Gly Glu Ala Glu Asp |      |      |
| 1795  | 1800 | 1805 |
| Arg Val Thr Ala Gly Pro Arg Pro Pro Val Ser Ser Gly Asn Leu Glu |      |      |
| 1810  | 1815 | 1820 |
| Ser Ser Thr Gln Ser Ala Ser Pro Phe His Arg Trp Gly Gln Thr Pro |      |      |
| 1825  | 1830 | 1835 |
| Ala Pro Gln Arg His Ser Gly Arg Val Val Gly Ala His Arg Pro Gly |      |      |
| 1845  | 1850 | 1855 |
| Leu Leu Ser Pro Val Phe Val Tyr Ser Pro Ala Phe Gln Ser Gly Gly |      |      |
| 1860  | 1865 | 1870 |
| Glu Glu Gly Leu Trp Met Ser Asn Thr Cys Thr Leu Arg             |      |      |
| 1875  | 1880 | 1885 |

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 <212> DNA

<213> Homo sapiens

<400> 29

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| gtcccggaga  | cgaggcgggt  | ccggggaggg | ggctggcccc  | gggctgcccc  | agcttgggccg | 180  |
| ggcgcggagc  | ggggcgcatg  | gcgcggggcg | cactgcgcgg  | gggctgcgaa  | caaagggccc  | 240  |
| ccggcggcgg  | cgcgaggacg  | gccgcgctcg | gacctgggcc  | ctggcccagc  | cctggcccgg  | 300  |
| ccccctcccc  | aggcgcgggc  | ccccccagga | gccgaaaaat  | gagcggcgcc  | ctgtctctggc | 360  |
| cgttgctccc  | gctcctgctc  | ctgtctgtgt | cggcgcggga  | cggcgtgcgc  | gccgcgcagc  | 420  |
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| gaagcaagcg  | ggcgggcccc  | gccctggaga | aaccgattcg  | tttaacacac  | ctttctgaga  | 1920 |
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| ccgtgacccc  | cagcatggtc  | ccccctggtc | gcctgctggg  | cttctacgtc  | agggagaatg  | 2040 |
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| Pro | Lys | Phe | Glu | Leu | Leu | Ile | Asp | Pro | Pro | Arg | Tyr | Ile | Gln | Asp | Leu | 325 | 330 | 335 |     |
| Asp | Ala | Cys | Glu | Thr | Gly | Thr | Val | Arg | Ala | Arg | Tyr | Thr | Phe | Gly | Lys | 340 | 345 | 350 |     |
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| Val | Gln | Arg | Gln | Leu | Val | Asp | Ile | Arg | Tyr | Ser | Lys | Asp | Thr | Arg | Lys | 435 | 440 | 445 |     |
| Gln | Phe | Lys | Pro | Gly | Leu | Ala | Tyr | Val | Gly | Lys | Val | Glu | Leu | Ser | Tyr | 450 | 455 | 460 |     |
| Pro | Asp | Gly | Ser | Pro | Ala | Glu | Gly | Val | Thr | Val | Gln | Ile | Lys | Ala | Glu | 465 | 470 | 475 | 480 |
| Leu | Thr | Pro | Lys | Asp | Asn | Ile | Tyr | Thr | Ser | Glu | Val | Val | Ser | Gln | Arg | 485 | 490 | 495 |     |
| Gly | Leu | Val | Gly | Phe | Glu | Ile | Pro | Ser | Ile | Pro | Thr | Ser | Ala | Gln | His | 500 | 505 | 510 |     |
| Val | Trp | Leu | Glu | Thr | Lys | Val | Met | Ala | Leu | Asn | Gly | Lys | Pro | Val | Gly | 515 | 520 | 525 |     |
| Ala | Gln | Tyr | Leu | Pro | Ser | Tyr | Leu | Ser | Leu | Gly | Ser | Trp | Tyr | Ser | Pro | 530 | 535 | 540 |     |
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| Thr | Leu | Tyr | Tyr | Glu | Val | Ala | Ala | Arg | Gly | Asn | Ile | Val | Leu | Ser | Gly | 580 | 585 | 590 |     |
| Gln | Gln | Pro | Ala | His | Thr | Thr | Gln | Gln | Arg | Ser | Lys | Arg | Ala | Ala | Pro | 595 | 600 | 605 |     |

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<210> 32  
 <211> 631  
 <212> PRT  
 <213> Homo sapiens

<400> 32  
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 Gly Phe Ala Val Gly Leu Gly Asn Ile Trp Arg Phe Pro Tyr Leu Cys  
 35 40 45  
 Gln Thr Tyr Gly Gly Gly Ala Phe Leu Ile Pro Tyr Val Ile Ala Leu  
 50 55 60  
 Val Phe Glu Gly Ile Pro Ile Phe His Val Glu Leu Ala Ile Gly Gln  
 65 70 75 80  
 Arg Leu Arg Lys Gly Ser Val Gly Val Trp Thr Ala Ile Ser Pro Tyr  
 85 90 95  
 Leu Ser Gly Val Gly Leu Gly Cys Val Thr Leu Ser Phe Leu Ile Ser  
 100 105 110  
 Leu Tyr Tyr Asn Thr Ile Val Ala Trp Val Leu Trp Tyr Leu Leu Asn  
 115 120 125  
 Ser Phe Gln His Pro Leu Pro Trp Ser Ser Cys Pro Pro Asp Leu Asn  
 130 135 140  
 Arg Thr Gly Phe Val Glu Glu Cys Gln Gly Ser Ser Ala Val Ser Tyr  
 145 150 155 160  
 Phe Trp Tyr Arg Gln Thr Leu Asn Ile Thr Ala Asp Ile Asn Asp Ser  
 165 170 175

Gly Ser Ile Gln Trp Trp Leu Leu Ile Cys Leu Ala Ala Ser Trp Ala  
 180 185 190  
 Val Val Tyr Met Cys Val Ile Arg Gly Ile Glu Thr Thr Gly Lys Val  
 195 200 205  
 Ile Tyr Phe Thr Ala Leu Phe Pro Tyr Leu Val Leu Thr Ile Phe Leu  
 210 215 220  
 Ile Arg Gly Leu Thr Leu Pro Gly Ala Thr Lys Gly Leu Ile Tyr Leu  
 225 230 235 240  
 Phe Thr Pro Asn Met His Ile Leu Gln Asn Pro Arg Val Trp Leu Asp  
 245 250 255  
 Ala Ala Thr Gln Ile Phe Phe Ser Leu Ser Leu Ala Phe Gly Gly His  
 260 265 270  
 Ile Ala Phe Ala Ser Tyr Asn Ser Pro Arg Arg Asn Asp Cys Gln Lys  
 275 280 285  
 Asp Ala Val Val Ile Ala Leu Val Asn Arg Met Thr Ser Leu Tyr Ala  
 290 295 300  
 Ser Ile Ala Val Phe Ser Val Leu Gly Phe Lys Ala Thr Asn Asp Gln  
 305 310 315 320  
 Glu His Cys Leu Asp Arg Asn Ile Leu Ser Leu Ile Asn Asp Phe Asp  
 325 330 335  
 Phe Pro Glu Gln Ser Ile Ser Arg Asp Asp Tyr Pro Ala Val Leu Met  
 340 345 350  
 His Leu Asn Ala Thr Trp Pro Lys Arg Val Ala Gln Leu Pro Leu Lys  
 355 360 365  
 Ala Cys Leu Leu Glu Asp Phe Leu Asp Lys Ser Ala Ser Gly Pro Gly  
 370 375 380  
 Leu Ala Phe Val Val Phe Thr Glu Thr Asp Leu His Met Pro Gly Ala  
 385 390 395 400  
 Pro Val Trp Ala Met Leu Phe Phe Gly Met Leu Phe Thr Leu Gly Leu  
 405 410 415  
 Ser Thr Met Phe Gly Thr Val Glu Ala Val Ile Thr Pro Leu Leu Asp  
 420 425 430  
 Val Gly Val Leu Pro Arg Trp Val Pro Lys Glu Ala Leu Thr Gly Pro  
 435 440 445  
 Gly Leu Val Cys Leu Val Cys Phe Leu Ser Ala Thr Cys Phe Thr Leu  
 450 455 460  
 Gln Ser Gly Asn Tyr Trp Leu Glu Ile Phe Asp Asn Phe Ala Ala Ser  
 465 470 475 480

Leu Asn Leu Leu Met Leu Ala Phe Leu Glu Val Val Gly Val Val Tyr  
 485 490 495  
 Val Tyr Gly Met Lys Arg Phe Cys Asp Asp Ile Ala Trp Met Thr Gly  
 500 505 510  
 Arg Arg Pro Ser Pro Tyr Trp Arg Leu Thr Trp Arg Val Val Ser Pro  
 515 520 525  
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 530 535 540  
 Pro Leu Arg Tyr Lys Ala Trp Asn Pro Lys Tyr Glu Leu Phe Pro Ser  
 545 550 555 560  
 Arg Gln Glu Lys Leu Tyr Pro Gly Trp Ala Arg Ala Ala Cys Val Leu  
 565 570 575  
 Leu Ser Leu Leu Pro Val Leu Trp Val Pro Val Ala Ala Leu Ala Gln  
 580 585 590  
 Leu Leu Thr Arg Arg Arg Arg Thr Trp Arg Asp Arg Asp Ala Arg Pro  
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 Asp Thr Asp Met Arg Pro Asp Thr Asp Thr Arg Pro Asp Thr Asp Met  
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 Arg Pro Asp Thr Asp Met Arg  
 625 630

<210> 33  
 <211> 2039  
 <212> DNA  
 <213> Homo sapiens

<400> 33  
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 gtccttcctg atcagcctgt actacaacac catcgtggcg tgggtgctgt ggtacctcct 480  
 caactccttc cagcaccgc tgccctggag ctctgccc cggacctca acagaacagg 540  
 ttttgtggag gagtgccagg gcagcagcgc cgtgagctac ttctggtacc ggcagacct 600  
 gaacatcaca gccgacatca atgacagtgg ctccatccag tgggtggctgc tcatctgctt 660  
 ggcagcctcc tgggcagtcg tgtacatgtg tgtcatcagg ggcattgaga ctacaggga 720  
 ggtgatattac ttcacagctt tgttccctta cctgggtcctg accatctttc tcatcagagg 780  
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<210> 34

<211> 639

<212> PRT

<213> Homo sapiens

<400> 34

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Met Ala His Ala Pro Glu Pro Asp Pro Ala Ala Ser Asp Leu Gly Asp
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Glu Arg Pro Lys Trp Asp Asn Lys Ala Gln Tyr Leu Leu Ser Cys Ile
          20                      25                      30

Gly Phe Ala Val Gly Leu Gly Asn Ile Trp Arg Phe Pro Tyr Leu Cys
          35                      40                      45

Gln Thr Tyr Gly Gly Gly Ala Phe Leu Ile Pro Tyr Val Ile Ala Leu
          50                      55                      60

Val Phe Glu Gly Ile Pro Ile Phe His Val Glu Leu Ala Ile Gly Gln
          65                      70                      75                      80

Arg Leu Arg Lys Gly Ser Val Gly Val Trp Thr Ala Ile Ser Pro Tyr
          85                      90                      95

Leu Ser Gly Val Gly Leu Gly Cys Val Thr Leu Ser Phe Leu Ile Ser
          100                     105                     110

Leu Tyr Tyr Asn Thr Ile Val Ala Trp Val Leu Trp Tyr Leu Leu Asn
          115                     120                     125

Ser Phe Gln His Pro Leu Pro Trp Ser Ser Cys Pro Pro Asp Leu Asn
          130                     135                     140

Arg Thr Gly Phe Val Glu Glu Cys Gln Gly Ser Ser Ala Val Ser Tyr
          145                     150                     155                     160

Phe Trp Tyr Arg Gln Thr Leu Asn Ile Thr Ala Asp Ile Asn Asp Ser
          165                     170                     175

Gly Ser Ile Gln Trp Trp Leu Leu Ile Cys Leu Ala Ala Ser Trp Ala
          180                     185                     190

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|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Val | Tyr | Met | Cys | Val | Ile | Arg | Gly | Ile | Glu | Thr | Thr | Gly | Lys | Val | 195 | 200 | 205 |
| Ile | Tyr | Phe | Thr | Ala | Leu | Phe | Pro | Tyr | Leu | Val | Leu | Thr | Ile | Phe | Leu | 210 | 215 | 220 |
| Ile | Arg | Gly | Leu | Thr | Leu | Pro | Gly | Ala | Thr | Lys | Gly | Leu | Ile | Tyr | Leu | 225 | 230 | 235 |
| Phe | Thr | Pro | Asn | Met | His | Ile | Leu | Gln | Asn | Pro | Arg | Val | Trp | Leu | Asp | 245 | 250 | 255 |
| Ala | Ala | Thr | Gln | Ile | Phe | Phe | Ser | Leu | Ser | Leu | Ala | Phe | Gly | Gly | His | 260 | 265 | 270 |
| Ile | Ala | Phe | Ala | Ser | Tyr | Asn | Ser | Pro | Arg | Arg | Asn | Asp | Cys | Gln | Lys | 275 | 280 | 285 |
| Asp | Ala | Val | Val | Ile | Ala | Leu | Val | Asn | Arg | Met | Thr | Ser | Leu | Tyr | Ala | 290 | 295 | 300 |
| Ser | Ile | Ala | Val | Phe | Ser | Val | Leu | Gly | Phe | Lys | Ala | Thr | Asn | Asp | Gln | 305 | 310 | 315 |
| Glu | His | Cys | Leu | Asp | Arg | Asn | Ile | Leu | Ser | Leu | Ile | Asn | Asp | Phe | Asp | 325 | 330 | 335 |
| Phe | Pro | Glu | Gln | Ser | Ile | Ser | Arg | Asp | Asp | Tyr | Pro | Ala | Val | Leu | Met | 340 | 345 | 350 |
| His | Leu | Asn | Ala | Thr | Trp | Pro | Lys | Arg | Val | Ala | Gln | Leu | Pro | Leu | Lys | 355 | 360 | 365 |
| Ala | Cys | Leu | Leu | Glu | Asp | Phe | Leu | Asp | Lys | Ser | Ala | Ser | Gly | Pro | Gly | 370 | 375 | 380 |
| Leu | Ala | Phe | Val | Val | Phe | Thr | Glu | Thr | Asp | Leu | His | Met | Pro | Gly | Ala | 385 | 390 | 395 |
| Pro | Val | Trp | Ala | Met | Leu | Phe | Phe | Gly | Met | Leu | Phe | Thr | Leu | Gly | Leu | 405 | 410 | 415 |
| Ser | Thr | Met | Phe | Gly | Thr | Val | Glu | Ala | Val | Ile | Thr | Pro | Leu | Leu | Asp | 420 | 425 | 430 |
| Val | Gly | Val | Leu | Pro | Arg | Trp | Val | Pro | Lys | Glu | Ala | Leu | Thr | Gly | Pro | 435 | 440 | 445 |
| Gly | Leu | Val | Cys | Leu | Val | Cys | Phe | Leu | Ser | Ala | Thr | Cys | Phe | Thr | Leu | 450 | 455 | 460 |
| Gln | Ser | Gly | Asn | Tyr | Trp | Leu | Glu | Ile | Phe | Asp | Asn | Phe | Ala | Ala | Ser | 465 | 470 | 475 |
| Leu | Asn | Leu | Leu | Met | Leu | Ala | Phe | Leu | Glu | Val | Val | Gly | Val | Val | Tyr | 485 | 490 | 495 |

Val Tyr Gly Met Lys Arg Phe Cys Asp Asp Ile Ala Trp Met Thr Gly  
500 505 510

Arg Arg Pro Ser Pro Tyr Trp Arg Leu Thr Trp Arg Val Val Ser Pro  
515 520 525

Leu Leu Leu Thr Ile Phe Val Ala Tyr Ile Ile Leu Leu Phe Trp Lys  
530 535 540

Pro Leu Arg Tyr Lys Ala Trp Asn Pro Gln Glu Leu Phe Pro Ser Arg  
545 550 555 560

Gln Glu Lys Leu Tyr Pro Gly Trp Ala Arg Ala Ala Cys Val Leu Leu  
565 570 575

Ser Leu Leu Pro Val Leu Trp Val Pro Val Ala Ala Leu Ala Gln Leu  
580 585 590

Leu Thr Arg Arg Arg Arg Thr Trp Arg Gln Ala His Ala Glu Ala Gly  
595 600 605

Leu Val Phe Gln Asp Phe Glu Lys Gln Arg Pro Gly Val Gly Ile Gln  
610 615 620

Tyr Leu Ile Pro Met Leu Cys Asn Leu Leu Gln Thr Leu Phe Arg  
625 630 635

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<211> 1748  
<212> DNA  
<213> Homo sapiens

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caactttgct gggatggctg tcttcacgcc tgtgattaat ggtgttgggg gcaatctggt 1200  
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ctctgagcaa gctcctcgcc gctgtcccag tccttgtacc accttcttca gccctggtgt 1320

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gaattctcgc tcagcccgga tctcttctct cctcgtgggc ccaggacacc tgggtgttcct 1380
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1748

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<210> 36
<211> 517
<212> PRT
<213> Homo sapiens

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<400> 36
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Gly Pro Ser Ala Ser Pro Cys Ser Ser Asp Gly Pro Gly Arg Glu Pro
              20              25              30

Leu Ala Gly Thr Ser Glu Phe Leu Gly Pro Asp Gly Ala Gly Val Glu
  35              40              45

Val Val Ile Glu Ser Arg Ala Asn Ala Lys Gly Val Arg Glu Glu Asp
  50              55              60

Ala Leu Leu Glu Asn Gly Ser Gln Ser Asn Glu Ser Asp Asp Val Ser
  65              70              75              80

Thr Asp Arg Gly Pro Ala Pro Pro Ser Pro Leu Lys Glu Thr Ser Phe
              85              90              95

Ser Ile Gly Leu Gln Val Leu Phe Pro Phe Leu Leu Ala Gly Phe Gly
  100              105              110

Thr Val Ala Gly Met Val Leu Asp Ile Val Gln His Trp Glu Val
  115              120              125

Phe Gln Lys Val Thr Glu Val Phe Ile Leu Val Pro Ala Leu Leu Gly
  130              135              140

Leu Lys Gly Asn Leu Glu Met Thr Leu Ala Ser Arg Leu Ser Thr Ala
  145              150              155              160

Ala Ser Ile Asn Ile Gly His Met Asp Thr Pro Lys Glu Leu Trp Arg
              165              170              175

Met Ile Thr Gly Asn Met Ala Leu Ile Gln Val Gln Ala Thr Val Val
  180              185              190

Gly Phe Leu Ala Ser Ile Ala Ala Val Val Phe Gly Trp Ile Pro Asp
  195              200              205

Gly His Phe Ser Ile Pro His Ala Phe Leu Leu Cys Ala Ser Ser Val
  210              215              220

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Ala Thr Ala Phe Ile Ala Ser Leu Val Leu Gly Met Ile Met Ile Gly  
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 Val Ile Ile Gly Ser Arg Lys Ile Gly Ile Asn Pro Asp Asn Val Ala  
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 Thr Pro Ile Ala Ala Ser Leu Gly Asp Leu Ile Thr Leu Ala Leu Leu  
 260 265 270  
 Ser Gly Ile Ser Trp Gly Leu Leu Thr Ser Ala Leu Ser Asp His Trp  
 275 280 285  
 Arg Tyr Ile Tyr Pro Leu Val Cys Ala Phe Phe Val Ala Leu Leu Pro  
 290 295 300  
 Val Trp Val Val Leu Ala Arg Arg Ser Pro Ala Thr Arg Glu Val Leu  
 305 310 315 320  
 Tyr Ser Gly Trp Glu Pro Val Ile Ile Ala Met Ala Ile Ser Ser Val  
 325 330 335  
 Gly Gly Leu Ile Leu Asp Lys Thr Val Ser Asp Pro Asn Phe Ala Gly  
 340 345 350  
 Met Ala Val Phe Thr Pro Val Ile Asn Gly Val Gly Gly Asn Leu Val  
 355 360 365  
 Ala Val Gln Ala Ser Arg Ile Ser Thr Phe Leu His Met Asn Gly Met  
 370 375 380  
 Pro Gly Glu Asn Ser Glu Gln Ala Pro Arg Arg Cys Pro Ser Pro Cys  
 385 390 395 400  
 Thr Thr Phe Phe Ser Pro Gly Val Asn Ser Arg Ser Ala Arg Val Leu  
 405 410 415  
 Phe Leu Leu Val Val Pro Gly His Leu Val Phe Leu Tyr Thr Ile Ser  
 420 425 430  
 Cys Met Gln Gly Gly His Thr Thr Leu Thr Leu Ile Phe Ile Ile Phe  
 435 440 445  
 Tyr Met Thr Ala Ala Leu Leu Gln Val Leu Ile Leu Leu Tyr Ile Ala  
 450 455 460  
 Asp Trp Met Val His Trp Met Trp Gly Arg Gly Leu Asp Pro Asp Asn  
 465 470 475 480  
 Phe Ser Ile Pro Tyr Leu Thr Ala Leu Gly Asp Leu Leu Gly Thr Gly  
 485 490 495  
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 Thr Asp Val Gly Asp  
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<210> 37  
 <211> 5175  
 <212> DNA  
 <213> Homo sapiens

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| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
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| Leu | Phe | Glu | Asp | Gly | Glu | Met | Ala | Lys | Tyr | Val | Gln | Gly | Asp | Ala | Ile |
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| Gly | Tyr | Glu | Gly | Phe | Gln | Gln | Phe | Leu | Lys | Ile | Tyr | Leu | Glu | Val | Asp |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Asn | Val | Pro | Arg | His | Leu | Ser | Leu | Ala | Leu | Phe | Gln | Ser | Phe | Glu | Thr |
|     | 65  |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Gly | His | Cys | Leu | Asn | Glu | Thr | Asn | Val | Thr | Lys | Asp | Val | Val | Cys | Leu |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Asn | Asp | Val | Ser | Cys | Tyr | Phe | Ser | Leu | Leu | Glu | Gly | Gly | Arg | Pro | Glu |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Asp | Lys | Leu | Glu | Phe | Thr | Phe | Lys | Leu | Tyr | Asp | Thr | Asp | Arg | Asn | Gly |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Ile | Leu | Asp | Ser | Ser | Met | Met | Arg | Val | Ala | Glu | Tyr | Leu | Asp | Trp | Asp |
|     | 130 |     |     |     |     | 135 |     |     |     |     |     | 140 |     |     |     |
| Val | Ser | Glu | Leu | Arg | Pro | Ile | Leu | Gln | Glu | Met | Met | Lys | Glu | Ile | Asp |
|     | 145 |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Tyr | Asp | Gly | Ser | Gly | Ser | Val | Ser | Gln | Ala | Glu | Trp | Val | Arg | Ala | Gly |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Ala | Thr | Thr | Val | Pro | Leu | Leu | Val | Leu | Leu | Gly | Leu | Glu | Met | Thr | Leu |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Lys | Asp | Asp | Gly | Gln | His | Met | Trp | Arg | Pro | Lys | Arg | Phe | Pro | Arg | Pro |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Val | Tyr | Cys | Asn | Leu | Cys | Glu | Ser | Ser | Ile | Gly | Leu | Gly | Lys | Gln | Gly |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Leu | Ser | Cys | Asn | Leu | Cys | Lys | Tyr | Thr | Val | His | Asp | Gln | Cys | Ala | Met |
|     | 225 |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Lys | Ala | Leu | Pro | Cys | Glu | Val | Ser | Thr | Tyr | Ala | Lys | Ser | Arg | Lys | Asp |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Ile | Gly | Val | Gln | Ser | His | Val | Trp | Val | Arg | Gly | Gly | Cys | Glu | Ser | Gly |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Arg | Cys | Asp | Arg | Cys | Gln | Lys | Lys | Ile | Arg | Ile | Tyr | His | Ser | Leu | Thr |

| 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Leu | His | Cys | Val | Trp | Cys | His | Leu | Glu | Ile | His | Asp | Asp | Cys | Leu |
| 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |     |
| Gln | Ala | Val | Gly | His | Glu | Cys | Asp | Cys | Gly | Leu | Leu | Arg | Asp | His | Ile |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |
| Leu | Pro | Pro | Ser | Ser | Ile | Tyr | Pro | Ser | Val | Leu | Ala | Ser | Gly | Pro | Asp |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |
| Arg | Lys | Asn | Ser | Lys | Thr | Ser | Gln | Lys | Thr | Met | Asp | Asp | Leu | Asn | Leu |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |
| Ser | Thr | Ser | Glu | Ala | Leu | Arg | Ile | Asp | Pro | Val | Pro | Asn | Thr | His | Pro |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |
| Leu | Leu | Val | Phe | Val | Asn | Pro | Lys | Ser | Gly | Gly | Lys | Gln | Gly | Gln | Arg |
| 370 |     |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |     |
| Val | Leu | Trp | Lys | Phe | Gln | Tyr | Ile | Leu | Asn | Pro | Arg | Gln | Val | Phe | Asn |
| 385 |     |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     | 400 |
| Leu | Leu | Lys | Asp | Gly | Pro | Glu | Ile | Gly | Leu | Arg | Leu | Phe | Lys | Asp | Val |
|     |     |     |     | 405 |     |     |     |     | 410 |     |     |     |     | 415 |     |
| Pro | Asp | Ser | Arg | Ile | Leu | Val | Cys | Gly | Gly | Asp | Gly | Thr | Val | Gly | Trp |
|     |     |     | 420 |     |     |     |     | 425 |     |     |     |     | 430 |     |     |
| Ile | Leu | Glu | Thr | Ile | Asp | Lys | Ala | Asn | Leu | Pro | Val | Leu | Pro | Pro | Val |
|     |     | 435 |     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |
| Ala | Val | Leu | Pro | Leu | Gly | Thr | Gly | Asn | Asp | Leu | Ala | Arg | Cys | Leu | Arg |
|     |     | 450 |     |     |     |     | 455 |     |     |     |     | 460 |     |     |     |
| Trp | Gly | Gly | Gly | Tyr | Glu | Gly | Gln | Asn | Leu | Ala | Lys | Ile | Leu | Lys | Asp |
| 465 |     |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |
| Leu | Glu | Met | Ser | Lys | Val | Val | His | Met | Asp | Arg | Trp | Ser | Val | Glu | Val |
|     |     |     |     | 485 |     |     |     |     | 490 |     |     |     |     | 495 |     |
| Ile | Pro | Gln | Gln | Thr | Glu | Glu | Lys | Ser | Asp | Pro | Val | Pro | Phe | Gln | Ile |
|     |     |     | 500 |     |     |     |     | 505 |     |     |     |     | 510 |     |     |
| Ile | Asn | Asn | Tyr | Phe | Ser | Ile | Gly | Val | Asp | Ala | Ser | Ile | Ala | His | Arg |
|     |     | 515 |     |     |     |     | 520 |     |     |     |     | 525 |     |     |     |
| Phe | His | Ile | Met | Arg | Glu | Lys | Tyr | Pro | Glu | Lys | Phe | Asn | Ser | Arg | Met |
|     |     | 530 |     |     |     |     | 535 |     |     |     |     | 540 |     |     |     |
| Lys | Asn | Lys | Leu | Trp | Tyr | Phe | Glu | Phe | Ala | Thr | Ser | Glu | Ser | Ile | Phe |
| 545 |     |     |     |     | 550 |     |     |     |     | 555 |     |     |     |     | 560 |
| Ser | Thr | Cys | Lys | Lys | Leu | Glu | Glu | Ser | Leu | Thr | Val | Glu | Ile | Cys | Gly |
|     |     |     |     | 565 |     |     |     |     | 570 |     |     |     |     | 575 |     |
| Lys | Pro | Leu | Asp | Leu | Ser | Asn | Leu | Ser | Leu | Glu | Gly | Ile | Ala | Val | Leu |

|   |     |     |
|---|-----|-----|
| 580   | 585 | 590 |
| Asn Ile Pro Ser Met His Gly Gly Ser Asn Leu Trp Gly Asp Thr Arg |     |     |
| 595   | 600 | 605 |
| Arg Pro His Gly Asp Ile Tyr Gly Ile Asn Gln Ala Leu Gly Ala Thr |     |     |
| 610   | 615 | 620 |
| Ala Lys Val Ile Thr Asp Pro Asp Ile Leu Lys Thr Cys Val Pro Asp |     |     |
| 625   | 630 | 635 |
| 640   |     |     |
| Leu Ser Asp Lys Arg Leu Glu Val Val Gly Leu Glu Gly Ala Ile Glu |     |     |
| 645   | 650 | 655 |
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| 660   | 665 | 670 |
| Lys Cys Ser Glu Ile Thr Phe His Thr Thr Lys Thr Leu Pro Met Gln |     |     |
| 675   | 680 | 685 |
| Ile Asp Val Glu Pro Trp Met Gln Thr Pro Cys Thr Ile Lys Ile Thr |     |     |
| 690   | 695 | 700 |
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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Arg | Ala | Leu | Leu | Ala | Ala | Gly | Pro | Ala | Leu | Ile | Ala | Asn | Gly | Asp | Glu |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Leu | Val | Ala | Ala | Val | Trp | Pro | Tyr | Arg | Arg | Leu | Ala | Leu | Leu | Arg | Arg |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Leu | Thr | Val | Leu | Pro | Phe | Ala | Gly | Leu | Leu | Tyr | Pro | Ala | Trp | Leu | Gly |
|     | 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     | 80  |
| Ala | Ala | Ala | Ala | Gly | Cys | Trp | Gly | Trp | Gly | Ser | Ser | Trp | Val | Gln | Ile |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Pro | Glu | Ala | Ala | Leu | Leu | Val | Leu | Ala | Thr | Ile | Cys | Leu | Ala | His | Ala |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Leu | Thr | Val | Leu | Ser | Gly | His | Trp | Ser | Val | His | Ala | His | Cys | Ala | Leu |
|     | 115 |     |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Thr | Cys | Thr | Pro | Glu | Tyr | Asp | Pro | Ser | Lys | Ala | Thr | Phe | Val | Lys | Val |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Val | Pro | Thr | Pro | Asn | Asn | Gly | Ser | Thr | Glu | Leu | Val | Ala | Leu | His | Arg |
|     | 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     | 160 |
| Asn | Glu | Gly | Glu | Asp | Gly | Leu | Glu | Val | Leu | Ser | Phe | Glu | Phe | Gln | Lys |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Ile | Lys | Tyr | Ser | Tyr | Asp | Ala | Leu | Glu | Lys | Lys | Gln | Phe | Leu | Pro | Val |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Ala | Phe | Pro | Val | Gly | Asn | Ala | Phe | Ser | Tyr | Tyr | Gln | Ser | Asn | Arg | Gly |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Phe | Gln | Glu | Asp | Ser | Glu | Ile | Arg | Ala | Ala | Glu | Lys | Lys | Phe | Gly | Ser |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Asn | Lys | Ala | Glu | Met | Val | Val | Pro | Asp | Phe | Ser | Glu | Leu | Phe | Lys | Glu |
|     | 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     | 240 |
| Arg | Ala | Thr | Ala | Pro | Phe | Phe | Val | Phe | Gln | Val | Phe | Cys | Val | Gly | Leu |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Trp | Cys | Leu | Asp | Glu | Tyr | Trp | Tyr | Tyr | Ser | Val | Phe | Thr | Leu | Ser | Met |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Leu | Val | Ala | Phe | Glu | Ala | Ser | Leu | Val | Gln | Gln | Gln | Met | Arg | Asn | Met |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Ser | Glu | Ile | Arg | Lys | Met | Gly | Asn | Lys | Pro | His | Met | Ile | Gln | Val | Tyr |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |
| Arg | Ser | Arg | Lys | Trp | Arg | Pro | Ile | Ala | Ser | Asp | Glu | Ile | Val | Pro | Gly |
|     | 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     | 320 |
| Asp | Ile | Val | Ser | Ile | Gly | Arg | Ser | Pro | Gln | Glu | Asn | Leu | Val | Pro | Cys |

|   |     |     |
|---|-----|-----|
| 325   | 330 | 335 |
| Asp Val Leu Leu Leu Arg Gly Arg Cys Ile Val Asp Glu Ala Met Leu |     |     |
| 340   | 345 | 350 |
| Thr Gly Glu Ser Val Pro Gln Met Lys Glu Pro Ile Glu Asp Leu Ser |     |     |
| 355   | 360 | 365 |
| Pro Asp Arg Val Leu Asp Leu Gln Ala Asp Ser Arg Leu His Val Ile |     |     |
| 370   | 375 | 380 |
| Phe Gly Gly Thr Lys Val Val Gln His Ile Pro Pro Gln Lys Ala Thr |     |     |
| 385   | 390 | 395 |
| 400   |     |     |
| Thr Gly Leu Lys Pro Val Asp Ser Gly Cys Val Ala Tyr Val Leu Arg |     |     |
| 405   | 410 | 415 |
| Thr Gly Phe Asn Thr Ser Gln Gly Lys Leu Leu Arg Thr Ile Leu Phe |     |     |
| 420   | 425 | 430 |
| Gly Val Lys Arg Val Thr Ala Asn Asn Leu Glu Thr Phe Ile Phe Ile |     |     |
| 435   | 440 | 445 |
| Leu Phe Leu Leu Val Phe Ala Ile Ala Ala Ala Tyr Val Trp Ile     |     |     |
| 450   | 455 | 460 |
| Glu Gly Thr Lys Asp Pro Ser Arg Asn Arg Tyr Lys Leu Phe Leu Glu |     |     |
| 465   | 470 | 475 |
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| Cys Thr Leu Ile Leu Thr Ser Val Val Pro Pro Glu Leu Pro Ile Glu |     |     |
| 485   | 490 | 495 |
| Leu Ser Leu Ala Val Asn Thr Ser Leu Ile Ala Leu Ala Lys Leu Tyr |     |     |
| 500   | 505 | 510 |
| Met Tyr Cys Thr Glu Pro Phe Arg Ile Pro Phe Ala Gly Lys Val Glu |     |     |
| 515   | 520 | 525 |
| Val Cys Cys Phe Asp Lys Thr Gly Thr Leu Thr Ser Asp Ser Leu Val |     |     |
| 530   | 535 | 540 |
| Val Arg Gly Val Ala Gly Leu Arg Asp Gly Lys Glu Val Thr Pro Val |     |     |
| 545   | 550 | 555 |
| 560   |     |     |
| Ser Ser Ile Pro Val Glu Thr His Arg Ala Leu Ala Ser Cys His Ser |     |     |
| 565   | 570 | 575 |
| Leu Met Gln Leu Asp Asp Gly Thr Leu Val Gly Asp Pro Leu Glu Lys |     |     |
| 580   | 585 | 590 |
| Ala Met Leu Thr Ala Val Asp Trp Thr Leu Thr Lys Asp Glu Lys Val |     |     |
| 595   | 600 | 605 |
| Phe Pro Arg Ser Ile Lys Thr Gln Gly Leu Lys Ile His Gln Arg Phe |     |     |
| 610   | 615 | 620 |
| His Phe Ala Ser Ala Leu Lys Arg Met Ser Val Leu Ala Ser Tyr Glu |     |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 625 |     | 630 |     | 635 |     | 640 |     |     |     |     |     |     |     |     |     |
| Lys | Leu | Gly | Ser | Thr | Asp | Leu | Cys | Tyr | Ile | Ala | Ala | Val | Lys | Gly | Ala |
|     |     |     |     | 645 |     |     |     |     | 650 |     |     |     |     | 655 |     |
| Pro | Glu | Thr | Leu | His | Ser | Met | Phe | Ser | Gln | Cys | Pro | Pro | Asp | Tyr | His |
|     |     |     | 660 |     |     |     |     | 665 |     |     |     |     | 670 |     |     |
| His | Ile | His | Thr | Glu | Ile | Ser | Arg | Glu | Gly | Ala | Arg | Val | Leu | Ala | Leu |
|     |     | 675 |     |     |     |     | 680 |     |     |     |     | 685 |     |     |     |
| Gly | Tyr | Lys | Glu | Leu | Gly | His | Leu | Thr | His | Gln | Gln | Ala | Arg | Glu | Val |
|     | 690 |     |     |     |     | 695 |     |     |     |     | 700 |     |     |     |     |
| Lys | Arg | Glu | Ala | Leu | Glu | Cys | Ser | Leu | Lys | Phe | Val | Gly | Phe | Ile | Val |
| 705 |     |     |     |     | 710 |     |     |     |     | 715 |     |     |     |     | 720 |
| Val | Ser | Cys | Pro | Leu | Lys | Ala | Asp | Ser | Lys | Ala | Val | Ile | Arg | Glu | Ile |
|     |     |     |     | 725 |     |     |     |     | 730 |     |     |     |     | 735 |     |
| Gln | Asn | Ala | Ser | His | Arg | Val | Val | Met | Ile | Thr | Gly | Asp | Asn | Pro | Leu |
|     |     |     | 740 |     |     |     |     | 745 |     |     |     |     | 750 |     |     |
| Thr | Ala | Cys | His | Val | Ala | Gln | Glu | Leu | His | Phe | Ile | Glu | Lys | Ala | His |
|     |     | 755 |     |     |     |     | 760 |     |     |     |     | 765 |     |     |     |
| Thr | Leu | Ile | Leu | Gln | Pro | Pro | Ser | Glu | Lys | Gly | Arg | Gln | Cys | Glu | Trp |
|     | 770 |     |     |     |     | 775 |     |     |     |     | 780 |     |     |     |     |
| Arg | Ser | Ile | Asp | Gly | Ser | Ile | Val | Leu | Pro | Leu | Ala | Arg | Gly | Ser | Pro |
| 785 |     |     |     |     | 790 |     |     |     |     | 795 |     |     |     |     | 800 |
| Lys | Ala | Leu | Ala | Leu | Glu | Tyr | Ala | Leu | Cys | Leu | Thr | Gly | Asp | Gly | Leu |
|     |     |     |     | 805 |     |     |     |     | 810 |     |     |     |     | 815 |     |
| Ala | His | Leu | Gln | Ala | Thr | Asp | Pro | Gln | Gln | Leu | Leu | Arg | Leu | Ile | Pro |
|     |     |     | 820 |     |     |     |     | 825 |     |     |     |     | 830 |     |     |
| His | Val | Gln | Val | Phe | Ala | Arg | Val | Ala | Pro | Lys | Gln | Lys | Glu | Phe | Val |
|     |     | 835 |     |     |     |     | 840 |     |     |     |     | 845 |     |     |     |
| Ile | Thr | Ser | Leu | Lys | Glu | Leu | Gly | Tyr | Val | Thr | Leu | Met | Cys | Gly | Asp |
|     | 850 |     |     |     |     | 855 |     |     |     |     | 860 |     |     |     |     |
| Gly | Thr | Asn | Asp | Val | Gly | Ala | Leu | Lys | His | Ala | Asp | Val | Gly | Val | Ala |
| 865 |     |     |     |     | 870 |     |     |     |     | 875 |     |     |     |     | 880 |
| Leu | Leu | Ala | Asn | Ala | Pro | Glu | Arg | Val | Val | Glu | Arg | Arg | Arg | Arg | Pro |
|     |     |     |     | 885 |     |     |     |     | 890 |     |     |     |     | 895 |     |
| Arg | Asp | Ser | Pro | Thr | Leu | Ser | Asn | Ser | Gly | Ile | Arg | Ala | Thr | Ser | Arg |
|     |     |     | 900 |     |     |     |     | 905 |     |     |     |     | 910 |     |     |
| Thr | Ala | Lys | Gln | Arg | Ser | Gly | Leu | Pro | Pro | Ser | Glu | Glu | Gln | Pro | Thr |
|     |     | 915 |     |     |     |     | 920 |     |     |     |     | 925 |     |     |     |
| Ser | Gln | Arg | Asp | Arg | Leu | Ser | Gln | Val | Leu | Arg | Asp | Leu | Glu | Asp | Glu |

| 930   | 935                     | 940            |
|---|-------------------------|----------------|
| Ser Thr Pro Ile Val Lys Leu Gly Asp Ala                         | Ser Ile Ala Ala Pro Phe |                |
| 945   | 950                     | 955 960        |
| Thr Ser Lys Leu Ser Ser Ile Gln Cys Ile Cys His Val Ile Lys Gln |                         |                |
|   | 965                     | 970 975        |
| Gly Arg Cys Thr Leu Val Thr Thr Leu Gln Met Phe Lys Ile Leu Ala |                         |                |
|   | 980                     | 985 990        |
| Leu Asn Ala Leu Ile Leu Ala Tyr Ser Gln Ser Val Leu Tyr Leu Glu |                         |                |
|   | 995                     | 1000 1005      |
| Gly Val Lys Phe Ser Asp Phe Gln Ala Thr Leu Gln Gly Leu Leu Leu |                         |                |
|   | 1010                    | 1015 1020      |
| Ala Gly Cys Phe Leu Phe Ile Ser Arg Ser Lys Pro Leu Lys Thr Leu |                         |                |
|   | 1025                    | 1030 1035 1040 |
| Ser Arg Glu Arg Pro Leu Pro Asn Ile Phe Asn Leu Tyr Thr Ile Leu |                         |                |
|   | 1045                    | 1050 1055      |
| Thr Val Met Leu Gln Phe Phe Val His Phe Leu Ser Leu Val Tyr Leu |                         |                |
|   | 1060                    | 1065 1070      |
| Tyr Arg Glu Ala Gln Ala Arg Ser Pro Glu Lys Gln Glu Gln Phe Val |                         |                |
|   | 1075                    | 1080 1085      |
| Asp Leu Tyr Lys Glu Phe Glu Pro Ser Leu Val Asn Ser Thr Val Tyr |                         |                |
|   | 1090                    | 1095 1100      |
| Ile Met Ala Met Ala Met Gln Met Ala Thr Phe Ala Ile Asn Tyr Lys |                         |                |
|   | 1105                    | 1110 1115 1120 |
| Gly Pro Pro Phe Met Glu Ser Leu Pro Glu Asn Lys Pro Leu Val Trp |                         |                |
|   | 1125                    | 1130 1135      |
| Ser Leu Ala Val Ser Leu Leu Ala Ile Ile Gly Leu Leu Leu Gly Ser |                         |                |
|   | 1140                    | 1145 1150      |
| Ser Pro Asp Phe Asn Ser Gln Phe Gly Leu Val Asp Ile Pro Val Glu |                         |                |
|   | 1155                    | 1160 1165      |
| Phe Lys Leu Val Ile Ala Gln Val Leu Leu Leu Asp Phe Cys Leu Ala |                         |                |
|   | 1170                    | 1175 1180      |
| Leu Leu Ala Asp Arg Val Leu Gln Phe Phe Leu Gly Thr Pro Lys Leu |                         |                |
|   | 1185                    | 1190 1195 1200 |
| Lys Val Pro Ser   |                         |                |

<210> 43  
 <211> 1167  
 <212> DNA



<213> Homo sapiens

<400> 43

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<211> 388

<212> PRT

<213> Homo sapiens

<400> 44

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Lys Val Val Ile Tyr Cys Gln Leu Arg Arg Asp His Lys Val Asn Gly
      20              25              30

Glu Glu Ile Ile Arg Leu Ile Val Gln Lys Arg Asn Val Thr Arg Ser
      35              40              45

Ile Asp Arg Ser Val Gly Ala Gly Gln Glu Gln Val Ile Met Glu Cys
      50              55              60

Leu Lys Pro Phe Tyr Phe Asn Tyr Pro Ser Leu Asp Ser Glu Val Leu
      65              70              75              80

Asp Asp Asp Arg Ala Ile Asp Gly Lys Asp Thr Ile Ile Leu Val Tyr
      85              90              95

Lys Glu Leu Ser Arg Asp Leu Ala Ser Cys Val Pro Ala Thr Pro Ala
      100              105              110

Val Ala Glu Arg Val Gln Gly Thr Val Gln Ala Met Ala Ser Lys Gly
      115              120              125

Ala Ser Pro Lys Ser Arg Gln Leu Ser Gln Gly Val Lys Pro Gly Ser
      130              135              140
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Thr Glu Gly Lys Cys Gly Leu Glu Pro Gln His Arg Ala Pro Leu Gly  
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 Thr Leu Pro Ser Gly Ala Leu Arg Arg Gly Pro Pro Phe Ser Arg Pro  
 165 170 175  
 Gln Asn Gly Arg Pro Thr Asp Ser Leu His Tyr Ala Leu Gly Lys Asp  
 180 185 190  
 Thr Asp Thr Gln His Gln Pro Met Lys Ala Ala Arg Arg Glu Ala Val  
 195 200 205  
 Pro Cys Thr Ala Thr Gly Ala Glu Leu Pro Lys Thr Met Gly Thr Gln  
 210 215 220  
 Leu Leu His Gln His Asp Pro Asp Val Arg Ile Gly Val Lys Glu Asp  
 225 230 235 240  
 His Phe Gly Ala Leu Arg Phe Asp Cys Pro Ser Arg Phe Trp Thr Tyr  
 245 250 255  
 Met Arg Thr Pro Ala Leu Leu Leu Cys Pro Leu Thr Ser Ala Thr Leu  
 260 265 270  
 His Thr Gly Cys Glu Leu Pro Pro Glu Glu Val Cys Gly Ser Ser Ser  
 275 280 285  
 Leu Cys Leu Ile Leu Thr Val Pro Lys Cys Val Trp Pro Tyr Gln Gln  
 290 295 300  
 Leu Gln Ala Leu Ser Leu Leu Tyr Phe Ser Phe Gly Ser Arg Arg Leu  
 305 310 315 320  
 Ile Ala Leu Lys Cys Asn Ile Ser Trp Ser Asn Tyr Ile Arg Phe His  
 325 330 335  
 Gly Ser Ala Ser Leu Ser Pro Lys Pro Ser Ser Cys Ile Ala Val Met  
 340 345 350  
 Phe Val Leu Lys Arg Leu Met Ser Leu Asp Tyr Asp Arg Lys Lys Val  
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 Ser Thr Ala Ala Ile Leu Ala Arg Ile Lys Arg Thr Gly Asp Gly Ser  
 370 375 380  
 Tyr Lys Ser Gly  
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<210> 45

<211> 853

<212> DNA

<213> Homo sapiens

<400> 45

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<210> 46  
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 <212> PRT  
 <213> Homo sapiens

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Arg Gln Ala Gly Glu Val Val His Asp Ala Leu Lys Asn Glu Val Asn
      20              25              30

Val Ile Leu Lys Gly Ser Pro Val Asp Leu Val Thr Ala Thr Asp Gln
      35              40              45

Lys Val Glu Lys Met Leu Ile Ser Ser Ile Lys Glu Lys Tyr Pro Ser
      50              55              60

His Arg Tyr Phe Phe Ile Val Arg Asn Leu Ala Ala Gly Glu Lys Gly
      65              70              75              80

Val Leu Thr Asp Asn Pro Thr Trp Ile Ile Asp Pro Ile Asp Gly Thr
      85              90              95

Thr Lys Phe Val His Arg Phe Pro Phe Val Ala Val Ser Ile Gly Leu
      100             105             110

Val Val Asn Lys Lys Val Glu Phe Gly Val Val Tyr Ser Cys Val Glu
      115             120             125

Asp Lys Arg Tyr Thr Val Arg Lys Gly Lys Gly Ala Phe Tyr Asn Gly
      130             135             140

Gln Lys Leu Gln Val Ser Gln Glu Gly Asp Ile Thr Lys Ser Leu Leu
      145             150             155             160

Val Thr Glu Leu Gly Tyr Cys Arg Thr Ser Glu Ile Val Arg Thr Ile
      165             170             175

Leu Ser Asn Met Glu Lys Leu Ser Cys Ile Pro Ile His Gly Ile Gln
      180             185             190

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Ser Val Gly Thr Ala Ala Thr Asn Met Cys Ile Ala Ala Ser Gly Gly  
195 200 205

Ala Glu Ala Phe Tyr Glu Met Gly Ile His Cys Trp Asp Ile Ala Val  
210 215 220

Ala Ala Ile Ile Val Thr Glu Ala Gly Gly Val Leu Met Asp Val Thr  
225 230 235 240

Gly Gly Pro Phe His Leu Met Ser Arg Arg Ile Ile Ala Ala Asn Cys  
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Thr Ala Leu Ala Glu Arg Ile Ala Lys Glu Ile Gln Val Ala Pro Phe  
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<210> 47  
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<212> DNA  
<213> Homo sapiens

<400> 47

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<210> 48  
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 <212> PRT  
 <213> Homo sapiens

<400> 48

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Met | Cys | Leu | Glu | Cys | Ala | Ser | Ala | Ala | Ala | Gly | Gly | Ala | Glu | Glu |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Glu | Glu | Ala | Asp | Ala | Glu | Arg | Arg | Arg | Arg | Arg | Arg | Gly | Ala | Gln | Arg |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Gly | Ala | Gly | Gly | Ser | Gly | Cys | Cys | Gly | Ala | Arg | Gly | Ala | Gly | Gly | Ala |
|     |     | 35  |     |     |     | 40  |     |     |     |     |     |     | 45  |     |     |
| Gly | Val | Ser | Ala | Ala | Gly | Asp | Glu | Val | Gln | Thr | Leu | Ser | Gly | Ser | Val |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Arg | Arg | Ala | Pro | Thr | Gly | Pro | Pro | Gly | Thr | Pro | Gly | Thr | Pro | Gly | Cys |
|     | 65  |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Ala | Ala | Thr | Ala | Lys | Gly | Pro | Gly | Ala | Gln | Gln | Pro | Lys | Pro | Ala | Ser |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Leu | Gly | Arg | Gly | Arg | Gly | Ala | Ala | Ala | Ala | Ile | Leu | Ser | Leu | Gly | Asn |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     |     | 110 |     |
| Val | Leu | Asn | Tyr | Leu | Asp | Arg | Tyr | Thr | Val | Ala | Gly | Val | Leu | Leu | Asp |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Ile | Gln | Gln | His | Phe | Gly | Val | Lys | Asp | Arg | Gly | Ala | Gly | Leu | Leu | Gln |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Ser | Val | Phe | Ile | Cys | Ser | Phe | Met | Val | Ala | Ala | Pro | Ile | Phe | Gly | Tyr |
|     | 145 |     |     | 150 |     |     |     |     | 155 |     |     |     |     |     | 160 |
| Leu | Gly | Asp | Arg | Phe | Asn | Arg | Lys | Val | Ile | Leu | Ser | Cys | Gly | Ile | Phe |
|     |     |     | 165 |     |     |     |     | 170 |     |     |     |     |     | 175 |     |
| Phe | Trp | Ser | Ala | Val | Thr | Phe | Ser | Ser | Ser | Phe | Ile | Pro | Gln | Gln | Tyr |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Phe | Trp | Leu | Leu | Val | Leu | Ser | Arg | Gly | Leu | Val | Gly | Ile | Gly | Glu | Ala |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Ser | Tyr | Ser | Thr | Ile | Ala | Pro | Thr | Ile | Ile | Gly | Asp | Leu | Phe | Thr | Lys |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Asn | Thr | Arg | Thr | Leu | Met | Leu | Ser | Val | Phe | Tyr | Phe | Ala | Ile | Pro | Leu |
|     | 225 |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Gly | Ser | Gly | Leu | Gly | Tyr | Ile | Thr | Gly | Ser | Ser | Val | Lys | Gln | Ala | Ala |  |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |  |
| Gly | Asp | Trp | His | Trp | Ala | Leu | Arg | Val | Ser | Pro | Val | Leu | Gly | Met | Ile |  |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |  |
| Thr | Gly | Thr | Leu | Ile | Leu | Ile | Leu | Val | Pro | Ala | Thr | Lys | Arg | Gly | His |  |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |  |
| Ala | Asp | Gln | Leu | Gly | Asp | Gln | Leu | Lys | Ala | Arg | Thr | Ser | Trp | Leu | Arg |  |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |  |
| Asp | Met | Lys | Ala | Leu | Ile | Arg | Asn | Arg | Ser | Tyr | Val | Phe | Ser | Ser | Leu |  |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |  |
| Ala | Thr | Ser | Ala | Val | Ser | Phe | Ala | Thr | Gly | Ala | Leu | Gly | Met | Trp | Ile |  |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |  |
| Pro | Leu | Tyr | Leu | His | Arg | Ala | Gln | Val | Val | Gln | Lys | Thr | Ala | Glu | Thr |  |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |  |
| Cys | Asn | Ser | Pro | Pro | Cys | Gly | Ala | Lys | Asp | Ser | Leu | Ile | Phe | Gly | Ala |  |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |  |
| Ile | Thr | Cys | Phe | Thr | Gly | Phe | Leu | Gly | Val | Val | Thr | Gly | Ala | Gly | Ala |  |
|     | 370 |     |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |  |
| Thr | Arg | Trp | Cys | Arg | Leu | Lys | Thr | Gln | Arg | Ala | Asp | Pro | Leu | Val | Cys |  |
| 385 |     |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     | 400 |  |
| Ala | Val | Gly | Met | Leu | Gly | Ser | Ala | Ile | Phe | Ile | Cys | Leu | Ile | Phe | Val |  |
|     |     |     |     | 405 |     |     |     |     | 410 |     |     |     |     | 415 |     |  |
| Ala | Ala | Lys | Ser | Ser | Ile | Val | Gly | Ala | Tyr | Ile | Cys | Ile | Phe | Val | Gly |  |
|     |     |     | 420 |     |     |     |     | 425 |     |     |     |     | 430 |     |     |  |
| Glu | Thr | Leu | Leu | Phe | Ser | Asn | Trp | Ala | Ile | Thr | Ala | Asp | Ile | Leu | Met |  |
|     |     | 435 |     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |  |
| Tyr | Val | Val | Ile | Pro | Thr | Arg | Arg | Ala | Thr | Ala | Val | Ala | Leu | Gln | Ser |  |
|     | 450 |     |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     |  |
| Phe | Thr | Ser | His | Leu | Leu | Gly | Asp | Ala | Gly | Ser | Pro | Tyr | Leu | Ile | Gly |  |
| 465 |     |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |  |
| Phe | Ile | Ser | Asp | Leu | Ile | Arg | Gln | Ser | Thr | Lys | Asp | Ser | Pro | Leu | Trp |  |
|     |     |     |     | 485 |     |     |     |     | 490 |     |     |     |     | 495 |     |  |
| Glu | Phe | Leu | Ser | Leu | Gly | Tyr | Ala | Leu | Met | Leu | Cys | Pro | Phe | Val | Val |  |
|     |     |     | 500 |     |     |     |     | 505 |     |     |     |     | 510 |     |     |  |
| Val | Leu | Gly | Gly | Met | Phe | Phe | Leu | Ala | Thr | Ala | Leu | Phe | Phe | Val | Ser |  |
|     |     | 515 |     |     |     |     | 520 |     |     |     |     | 525 |     |     |     |  |
| Asp | Arg | Ala | Arg | Ala | Glu | Gln | His | Leu | Gly | Glu | Arg | Arg | Ala | Gly | Val |  |
|     | 530 |     |     |     |     | 535 |     |     |     |     | 540 |     |     |     |     |  |

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Arg Val Val Gly Ala Ser  
 565

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 aaaataaaat taataccact tagtagtggt ttatttttgt atatttggtat acaaattaat 240  
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 aacaaaatca acccatttta tcagaagtgg aacttcctcc catttcttca ggttccttat 360  
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 aaaaacatga agacaaatgc ttaccaagtt atccccactc tggtgagtgc tctcttttta 720  
 tttgcaactt aaaaatagtt atctgttggt ct 752

<210> 50  
 <211> 240  
 <212> PRT  
 <213> Homo sapiens

<400> 50  
 Met Lys Phe Phe Ile Phe Thr Cys Leu Leu Ala Val Ala Leu Ala His  
 1 5 10 15  
 His Glu Leu Lys His Val Tyr Lys Lys Lys Thr Asn Asn Asn Val Ser  
 20 25 30  
 Asp Lys Tyr Arg Asn Val Lys Asn Gln Ile Ser Ser Pro Gln Glu Asp  
 35 40 45  
 Lys Val Arg Gly Asn Phe His Ser Asn Lys Ile Lys Leu Ile Pro Leu  
 50 55 60  
 Ser Ser Val Leu Phe Leu Tyr Ile Cys Ile Gln Ile Asn Phe Phe Ser  
 65 70 75 80  
 Tyr Gln Glu Val Lys His Thr Val Asp Gln Lys His Tyr Val Lys Gln  
 85 90 95  
 Leu Asn Lys Ile Asn Pro Phe Tyr Gln Lys Trp Asn Phe Leu Pro Phe  
 100 105 110  
 Leu Gln Val Pro Tyr Gln His Gln Ile Phe Ile Asn Pro Gly Asp Gln  
 115 120 125

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| His | Lys | Thr | Ser | Val | Tyr | Pro | Phe | Val | Pro | Thr | Lys | Tyr | Ile | Gln | Trp |
| 130 |     |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Pro | Gly | Ser | Val | Ala | Gln | Ala | Phe | Leu | Phe | Tyr | Ser | Phe | Lys | Glu | Thr |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Pro | Lys | Lys | Thr | Val | Asp | Met | Val | Lys | Tyr | Cys | Phe | Tyr | Gln | Lys | Thr |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Glu | Leu | Thr | Glu | Glu | Glu | Lys | Asn | Asp | Gln | Lys | His | Leu | Asn | Lys | Ile |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Asn | Gln | Tyr | Tyr | Gln | Phe | Thr | Leu | Pro | Gln | Tyr | Val | Lys | Ala | Val | Tyr |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Gln | Tyr | His | Lys | Ile | Met | Lys | Pro | Trp | Lys | Asn | Met | Lys | Thr | Asn | Ala |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Tyr | Gln | Val | Ile | Pro | Thr | Leu | Val | Ser | Ala | Leu | Phe | Leu | Phe | Ala | Thr |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |

<210> 51  
 <211> 1704  
 <212> DNA  
 <213> Homo sapiens

<400> 51

|             |            |            |            |            |             |      |
|-------------|------------|------------|------------|------------|-------------|------|
| cctgacgctt  | tgatggtatc | tgcaagcggt | tttgctgac  | ttatctctgc | ccctgaata   | 60   |
| ttaattccct  | aatctggtag | caatccatct | ccccagtga  | ggacctacta | gaggcaggtg  | 120  |
| gggggagcca  | ccatcagatc | atcaagcata | agaataatac | aaaggggagg | gattcttctg  | 180  |
| caaccaagag  | gcaagaggcg | agagaaggaa | aaaaaaaaaa | aaagcgatga | gttcaccaaaa | 240  |
| tatatggagc  | acaggaagct | cagtctactc | gactcctgta | ttttcacaga | aaatgacggg  | 300  |
| gtggattctg  | ctcctgctgt | cgctctaccc | tggcttcaat | agccagaaat | ctgatgatga  | 360  |
| ctatgaagat  | tatgcttcta | acaaaacatg | ggctctgact | ccaaaagttc | ctgagggtga  | 420  |
| tgtcactgtc  | atcttaaaca | acctgctgga | aggatatgac | aataaacttc | ggcctgatat  | 480  |
| aggagtgaag  | ccaacgttaa | ttcacacaga | catgtatgtg | aatagcattg | gtccagtga   | 540  |
| cgctatcaat  | atggaataca | ctattgatat | attttttgcg | caaagtgtgt | atgacagacg  | 600  |
| tttgaatttt  | aacagcacca | ttaaagtcct | ccgattgaac | agcaacatgg | tggggaaaaat | 660  |
| ctggattcca  | gacactttct | tcagaaattc | caaaaaagct | gatgcacact | ggatcaccac  | 720  |
| ccccaacagg  | atgctgagaa | tttggaatga | tggtcgagtg | ctctactccc | taagggtgac  | 780  |
| aattgatgct  | gagtgccaat | tacaattgca | caattttcca | atggatgaac | actcctgccc  | 840  |
| cttgaggttc  | tccagttatg | gctatccacg | tgaagaaatt | gtttatcaat | ggaagcgaag  | 900  |
| ttctgttgaa  | gtgggcgaca | caagatcctg | gaggctttat | caattctcat | ttgttggtct  | 960  |
| aagaaatacc  | accgaagtag | tgaagacaac | ttccggagat | tatgtggtca | tgtctgtcta  | 1020 |
| ctttgatctg  | agcagaagaa | tgggataact | taccatccag | acctatatcc | cctgcacact  | 1080 |
| cattgtcgtc  | ctatcctggg | tgtctttctg | gatcaataag | gatgctgttc | cagccagaac  | 1140 |
| atctttagggt | atcaccactg | tcctgacaat | gaccaccctc | agcaccattg | cccggaaatc  | 1200 |
| gtcccccaag  | gtctcctatg | tcacagcgat | ggatctcttt | gtatctgttt | gtttcatctt  | 1260 |
| tgtcttctct  | gctctggtgg | agtatggcac | cttgcatatt | tttgtcagca | accggaaacc  | 1320 |
| aagcaaggac  | aaagataaaa | agaagaaaaa | ccctcttctt | cggatgtttt | ccttcaaggc  | 1380 |
| ccctaccatt  | gatatccgcc | caagatcagc | aaccattcaa | atgaataatg | ctacacacct  | 1440 |
| tcaagagaga  | gatgaagagt | acggctatga | gtgtctggac | ggcaaggact | gtgccagttt  | 1500 |



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tttctgctgt tttgaagatt gtcgaacagg agcttggaga catgggagga tacatatccg 1560
cattgccaaa atggactcct atgctcggat cttcttcccc actgccttct gcctgtttaa 1620
tctgggtctat tgggtctcct acctctacct gtgaggaggt atgggtttta ctgatatggt 1680
tcttattcac tgagtctcat ggag 1704

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<210> 52
<211> 475
<212> PRT
<213> Homo sapiens

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<400> 52
Met Ser Ser Pro Asn Ile Trp Ser Thr Gly Ser Ser Val Tyr Ser Thr
  1              5              10              15

Pro Val Phe Ser Gln Lys Met Thr Val Trp Ile Leu Leu Leu Leu Ser
      20              25              30

Leu Tyr Pro Gly Phe Thr Ser Gln Lys Ser Asp Asp Asp Tyr Glu Asp
      35              40              45

Tyr Ala Ser Asn Lys Thr Trp Val Leu Thr Pro Lys Val Pro Glu Gly
      50              55              60

Asp Val Thr Val Ile Leu Asn Asn Leu Leu Glu Gly Tyr Asp Asn Lys
      65              70              75              80

Leu Arg Pro Asp Ile Gly Val Lys Pro Thr Leu Ile His Thr Asp Met
      85              90              95

Tyr Val Asn Ser Ile Gly Pro Val Asn Ala Ile Asn Met Glu Tyr Thr
      100             105             110

Ile Asp Ile Phe Phe Ala Gln Met Trp Tyr Asp Arg Arg Leu Lys Phe
      115             120             125

Asn Ser Thr Ile Lys Val Leu Arg Leu Asn Ser Asn Met Val Gly Lys
      130             135             140

Ile Trp Ile Pro Asp Thr Phe Phe Arg Asn Ser Lys Lys Ala Asp Ala
      145             150             155             160

His Trp Ile Thr Thr Pro Asn Arg Met Leu Arg Ile Trp Asn Asp Gly
      165             170             175

Arg Val Leu Tyr Ser Leu Arg Leu Thr Ile Asp Ala Glu Cys Gln Leu
      180             185             190

Gln Leu His Asn Phe Pro Met Asp Glu His Ser Cys Pro Leu Glu Phe
      195             200             205

Ser Ser Tyr Gly Tyr Pro Arg Glu Glu Ile Val Tyr Gln Trp Lys Arg
      210             215             220

Ser Ser Val Glu Val Gly Asp Thr Arg Ser Trp Arg Leu Tyr Gln Phe
      225             230             235             240

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Ser Phe Val Gly Leu Arg Asn Thr Thr Glu Val Val Lys Thr Thr Ser  
 245 250 255  
 Gly Asp Tyr Val Val Met Ser Val Tyr Phe Asp Leu Ser Arg Arg Met  
 260 265 270  
 Gly Tyr Phe Thr Ile Gln Thr Tyr Ile Pro Cys Thr Leu Ile Val Val  
 275 280 285  
 Leu Ser Trp Val Ser Phe Trp Ile Asn Lys Asp Ala Val Pro Ala Arg  
 290 295 300  
 Thr Ser Leu Gly Ile Thr Thr Val Leu Thr Met Thr Thr Leu Ser Thr  
 305 310 315 320  
 Ile Ala Arg Lys Ser Leu Pro Lys Val Ser Tyr Val Thr Ala Met Asp  
 325 330 335  
 Leu Phe Val Ser Val Cys Phe Ile Phe Val Phe Ser Ala Leu Val Glu  
 340 345 350  
 Tyr Gly Thr Leu His Tyr Phe Val Ser Asn Arg Lys Pro Ser Lys Asp  
 355 360 365  
 Lys Asp Lys Lys Lys Lys Asn Pro Leu Leu Arg Met Phe Ser Phe Lys  
 370 375 380  
 Ala Pro Thr Ile Asp Ile Arg Pro Arg Ser Ala Thr Ile Gln Met Asn  
 385 390 395 400  
 Asn Ala Thr His Leu Gln Glu Arg Asp Glu Glu Tyr Gly Tyr Glu Cys  
 405 410 415  
 Leu Asp Gly Lys Asp Cys Ala Ser Phe Phe Cys Cys Phe Glu Asp Cys  
 420 425 430  
 Arg Thr Gly Ala Trp Arg His Gly Arg Ile His Ile Arg Ile Ala Lys  
 435 440 445  
 Met Asp Ser Tyr Ala Arg Ile Phe Phe Pro Thr Ala Phe Cys Leu Phe  
 450 455 460  
 Asn Leu Val Tyr Trp Val Ser Tyr Leu Tyr Leu  
 465 470 475

<210> 53  
 <211> 1602  
 <212> DNA  
 <213> Homo sapiens

<400> 53  
 atgcggtgc acagacttca cgcgcggccg agcgcggtgg cctgtgggct cctgctgctt 60  
 ctgatgctgt gtgggcccga agttgctcag cctgaagtag acaccaccct gggtcgtgtg 120  
 cgaggccggc aggtgggcgt gaagggcaca gaccgccttg tgaatgtctt tctgggcatt 180  
 ccatttgccc agccgccact gggccctgac cggttctcag cccacacccc agcacagccc 240  
 tgggaggggtg tgcgggatgc cagcactgcg cccccaatgt gcctacaaga cgtgatgaac 300

```

agcagcagat ttgtcctcaa cggaaaacag cagatcttct ccgtttcaga ggactgcctg 360
gtcctcaacg tctatagccc agctgaggtc atgggtatggg tccatggagg cgctctgata 420
actggcgctg ccacctccta cgatggatca gctctggctg cctatgggga tgtggctgctg 480
gttacagtcc agtaccgcct tggggtcctt ggcttcttca gcactggaga tgagcatgca 540
cctgggaacc agggcttctt agatgtggta gctgctttgc gctgggtgca agaaaacatc 600
gcccccttcg ggggtgacct caactgtgtc actgtctttg gtggatctgc cgggtgggagc 660
atcatctctg gcctgggtct gtccccagtg gctgcagggc tgttccacag agccatcaca 720
cagagtgggg tcatcaccac cccagggatc atcgactctc acccttggcc cctagctcag 780
aaaatcgcaa acaccttggc ctgcagctcc agctccccgg ctgagatggg gcagtgcctt 840
cagcagaaag aaggagaaga gctggtcctt agcaagaagc tgaaaaatac tatctatcct 900
ctcaccgttg atggcactgt cttccccaaa agccccaagg aactcctgaa ggagaagccc 960
ttccactctg tgcccttctt catgggtgtc aacaaccatg agttcagctg gctcatcccc 1020
gggaccaagg tgatgcgtgt gtccaacaag atgatcatga agttcccgt aaaccggcag 1080
gcgatgagaa aggaaaccat cactaagatg ctctggagta cccgcaccct gttggagcat 1140
gactggaaga tgctacgaaa ccgtatgatg gacatagttc aagatgccac tttcgtgtat 1200
gccacactgc agactgctca ctaccaccga gatgccggcc tccctgtcta cctgtatgaa 1260
tttgagcacc acgctcgtgg aataatcgtc aaaccccgca ctgatggggc agaccatggg 1320
gatgagatgt acttctctt tgggggcccc ttgccacag gcctttccat gggttaaggag 1380
aaggcactta gcctccagat gatgaaatac tgggccaaact ttgccgcac aggaaacccc 1440
aatgatggga atctgccctg ctggccacgc tacaacaagg atgaaaagta cctgcagctg 1500
gattttacca caagagtggg catgaagctc aaggagaaga agatggcttt ttggatgagt 1560
ctgtaccagt ctcaaagacc tgagaagcag aggcaattct aa 1602

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<210> 54

<211> 533

<212> PRT

<213> Homo sapiens

<400> 54

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Met Arg Leu His Arg Leu His Ala Arg Pro Ser Ala Val Ala Cys Gly
  1             5             10            15

Leu Leu Leu Leu Leu Met Leu Cys Gly Pro Glu Val Ala Gln Pro Glu
      20             25             30

Val Asp Thr Thr Leu Gly Arg Val Arg Gly Arg Gln Val Gly Val Lys
      35             40             45

Gly Thr Asp Arg Leu Val Asn Val Phe Leu Gly Ile Pro Phe Ala Gln
      50             55             60

Pro Pro Leu Gly Pro Asp Arg Phe Ser Ala Pro His Pro Ala Gln Pro
      65             70             75             80

Trp Glu Gly Val Arg Asp Ala Ser Thr Ala Pro Pro Met Cys Leu Gln
      85             90             95

Asp Val Met Asn Ser Ser Arg Phe Val Leu Asn Gly Lys Gln Gln Ile
      100            105            110

Phe Ser Val Ser Glu Asp Cys Leu Val Leu Asn Val Tyr Ser Pro Ala
      115            120            125

Glu Val Met Val Trp Val His Gly Gly Ala Leu Ile Thr Gly Ala Ala
      130            135            140

```

Thr Ser Tyr Asp Gly Ser Ala Leu Ala Ala Tyr Gly Asp Val Val Val  
 145 150 155 160  
 Val Thr Val Gln Tyr Arg Leu Gly Val Leu Gly Phe Phe Ser Thr Gly  
 165 170 175  
 Asp Glu His Ala Pro Gly Asn Gln Gly Phe Leu Asp Val Val Ala Ala  
 180 185 190  
 Leu Arg Trp Val Gln Glu Asn Ile Ala Pro Phe Gly Gly Asp Leu Asn  
 195 200 205  
 Cys Val Thr Val Phe Gly Gly Ser Ala Gly Gly Ser Ile Ile Ser Gly  
 210 215 220  
 Leu Val Leu Ser Pro Val Ala Ala Gly Leu Phe His Arg Ala Ile Thr  
 225 230 235 240  
 Gln Ser Gly Val Ile Thr Thr Pro Gly Ile Ile Asp Ser His Pro Trp  
 245 250 255  
 Pro Leu Ala Gln Lys Ile Ala Asn Thr Leu Ala Cys Ser Ser Ser Ser  
 260 265 270  
 Pro Ala Glu Met Val Gln Cys Leu Gln Gln Lys Glu Gly Glu Glu Leu  
 275 280 285  
 Val Leu Ser Lys Lys Leu Lys Asn Thr Ile Tyr Pro Leu Thr Val Asp  
 290 295 300  
 Gly Thr Val Phe Pro Lys Ser Pro Lys Glu Leu Leu Lys Glu Lys Pro  
 305 310 315 320  
 Phe His Ser Val Pro Phe Leu Met Gly Val Asn Asn His Glu Phe Ser  
 325 330 335  
 Trp Leu Ile Pro Gly Thr Lys Val Met Arg Val Ser Asn Lys Met Ile  
 340 345 350  
 Met Lys Phe Pro Leu Asn Arg Gln Ala Met Arg Lys Glu Thr Ile Thr  
 355 360 365  
 Lys Met Leu Trp Ser Thr Arg Thr Leu Leu Glu His Asp Trp Lys Met  
 370 375 380  
 Leu Arg Asn Arg Met Met Asp Ile Val Gln Asp Ala Thr Phe Val Tyr  
 385 390 395 400  
 Ala Thr Leu Gln Thr Ala His Tyr His Arg Asp Ala Gly Leu Pro Val  
 405 410 415  
 Tyr Leu Tyr Glu Phe Glu His His Ala Arg Gly Ile Ile Val Lys Pro  
 420 425 430  
 Arg Thr Asp Gly Ala Asp His Gly Asp Glu Met Tyr Phe Leu Phe Gly  
 435 440 445

Gly Pro Phe Ala Thr Gly Leu Ser Met Gly Lys Glu Lys Ala Leu Ser  
 450 455 460  
 Leu Gln Met Met Lys Tyr Trp Ala Asn Phe Ala Arg Thr Gly Asn Pro  
 465 470 475 480  
 Asn Asp Gly Asn Leu Pro Cys Trp Pro Arg Tyr Asn Lys Asp Glu Lys  
 485 490 495  
 Tyr Leu Gln Leu Asp Phe Thr Thr Arg Val Gly Met Lys Leu Lys Glu  
 500 505 510  
 Lys Lys Met Ala Phe Trp Met Ser Leu Tyr Gln Ser Gln Arg Pro Glu  
 515 520 525  
 Lys Gln Arg Gln Phe  
 530

<210> 55  
 <211> 996  
 <212> DNA  
 <213> Homo sapiens

<400> 55  
 ctctcgaatt cccccaccca cctgtactct ggagagactg tgctgggaac atgtaccact 60  
 gagcctgaga tggggatgag ggcagagaga ggggagcccc ctcttccact cagttgttcc 120  
 tactcagact gttgcactct aaacctaggg aggttgaaga atgagaccct taggttttaa 180  
 cacgaatcct gacaccacca tctatagggt cccaacttgg ttattgtagg caaccttccc 240  
 tctctccttg gtgaagaaca tccaagcca gaaagaagtt aactacagtg ttttcctttg 300  
 caccgatccc caccccaatt caatcccgga agggacttac ttaggaaacc cttctttact 360  
 agatatcctg gccccctggg cttgtgaaca cctcctagcc acatcactac agtacagtga 420  
 gtgaccccag cctcctgcct accccaagat gccctcccc accctgaccg tgctaactgt 480  
 gtgtacatat atattctaca tatatgtata ttaaaactgc actgccatgt ctgccctttt 540  
 ttgtggtgtc tagcattaac ttattgtcta ggccagagcg ggggtgggag gggaatgcc 600  
 cagtgaaggg agtggcagaa tcaaattgct acatagtcca aacaaaaaag aaggcttttt 660  
 caaaaaacat taaattcaca tgcagtctca gagactattt agacaaagtt caagtttagga 720  
 gcttttagga tgtgggagta aaactttaat gggaggggag ggctggctgc tggaagaagg 780  
 aagaagccag actggttaga cagtactctt aactcctagc ccagcctagc gtgccctgcc 840  
 cctctggcca ctgctgcaga cacctgcctt aacacacaca cctctaggac tccacagttt 900  
 tgccttaaag gaccttccca agtctccctt tccctgtctg gcttctccct taagaagaga 960  
 gagatacttg tagaattggg tgggggaatt cgagag 996

<210> 56  
 <211> 74  
 <212> PRT  
 <213> Homo sapiens

<400> 56  
 Met Tyr Ile Lys Thr Ala Leu Pro Cys Leu Pro Phe Phe Val Val Ser  
 1 5 10 15  
 Ser Ile Asn Leu Leu Ser Arg Pro Glu Arg Gly Trp Glu Gly Asn Ala  
 20 25 30  
 Thr Val Lys Gly Val Ala Glu Ser Asn Cys Tyr Ile Val Gln Thr Lys

35                      40                      45  
 Lys Lys Ala Phe Ser Lys Asn Ile Lys Phe Thr Cys Ser Leu Arg Asp  
     50                      55                      60  
 Tyr Leu Asp Lys Val Gln Val Arg Ser Phe  
     65                      70

<210> 57  
 <211> 668  
 <212> DNA  
 <213> Homo sapiens

<400> 57  
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 tggttcgtgc cgaagggacc caaccgcgga gtgatcatca ccatgctggt cgccaccgcc 120  
 gtctgctgtt acctcttctg gtcacatgcc atcctggcgc agctgaaccc cctgttcggg 180  
 cccagctga agaatgagac catctggtac gtgcgcttcc tgtgggagtg acccgccgcc 240  
 cccgaccag gtgcccagct ctcggaatga ctgtggctcc actgtccctg acaaccctt 300  
 cgtccggacc ctccccaca caactatgtc tggtcaccag ctccctcctg ctggcaccca 360  
 gagaccggga cccgcagggc ctgcctggtt cctggaagtc ttcccagtct tcccagccag 420  
 cccggggcct ggggagccct gggcacagca gcggccgagg ggatgtcctg ctccaatacc 480  
 cgcactgtc tggagtttgc cctctttccc aaggagatgc tgctggggag ctggtatggg 540  
 tggggtcttt ccctttacag acggggcaga tgccaggact cagcccatcc tgaggaggac 600  
 acgtgtcctc atggagaggg tgctccggcc caggcggggg agtcggtgcc cagtcagcag 660  
 gaccaggc 668

<210> 58  
 <211> 76  
 <212> PRT  
 <213> Homo sapiens

<400> 58  
 Phe Ala Leu Pro Val Ile Ile Phe Thr Thr Phe Trp Gly Leu Val Gly  
     1                      5                      10                      15  
 Ile Ala Gly Pro Trp Phe Val Pro Lys Gly Pro Asn Arg Gly Val Ile  
     20                      25                      30  
 Ile Thr Met Leu Val Ala Thr Ala Val Cys Cys Tyr Leu Phe Trp Leu  
     35                      40                      45  
 Ile Ala Ile Leu Ala Gln Leu Asn Pro Leu Phe Gly Pro Gln Leu Lys  
     50                      55                      60  
 Asn Glu Thr Ile Trp Tyr Val Arg Phe Leu Trp Glu  
     65                      70                      75

<210> 59  
 <211> 5587  
 <212> DNA  
 <213> Homo sapiens

<400> 59

|             |             |            |             |             |             |      |
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| aagtgcattc  | gccgctcctg  | ggtgtgtgac | ggggacaacg  | actgtgagga  | tgactcggat  | 120  |
| gagcaggact  | gtcccccccg  | ggagtgtgag | gaggacgagt  | ttccctgcca  | gaatggctac  | 180  |
| tgcatccgga  | gtctgtggca  | ctgcgatggt | gacaatgact  | gtggcgacaa  | cagcgtatgag | 240  |
| cagtgtgaca  | tgcgcaagtg  | ctccgacaag | gagttccgct  | gtagtgcagg  | aagctgcatt  | 300  |
| gctgagcatt  | ggtactgcga  | cggtgacacc | gactgcaaag  | atggctccga  | tgaggagaac  | 360  |
| tgtccctcag  | cagtgccagc  | gccccctgc  | aacctggagg  | agttccagtg  | tgcttatgga  | 420  |
| cgctgcattc  | tcgacatcta  | ccactgcgat | ggcgacgatg  | actgtggaga  | ctggctcagac | 480  |
| gagtctgact  | gctgtgagta  | ctctggccag | ctgggagcct  | cccaccagcc  | ctgccgctct  | 540  |
| ggggagttca  | tgtgtgacag  | tgacctgtgc | atcaatgcag  | gctggcgctg  | cgatgggtgac | 600  |
| gcggactgtg  | atgaccagtc  | tgatgagcgc | aactgcacca  | cctccatgtg  | tacggcagaa  | 660  |
| cagttccgct  | gtcactcagg  | ccgctgtgtc | cgcctgtcct  | ggcgctgtga  | tggggaggac  | 720  |
| gactgtgcag  | acaacagcga  | tgaagagaac | tgtgagaata  | caggaagccc  | ccaatgtgcc  | 780  |
| ttggaccagt  | tcctgtgttg  | gaatgggcgc | tgcatggggc  | agaggaagct  | gtgcaacggg  | 840  |
| gtcaacgact  | gtggtgacaa  | cagcgacgaa | agcccacagc  | agaattgccg  | gccccggacg  | 900  |
| ggtgaggaga  | actgcaatgt  | taacaacggg | ggctgtgccc  | agaagtgcc   | gatggtgcgg  | 960  |
| ggggcagtg   | agtgtacctg  | ccacacaggc | taccggctca  | cagaggatgg  | gcacacgtgc  | 1020 |
| caagatgtga  | atgaatgtgc  | cgaggagggg | tattgcagcc  | agggctgcac  | caacagcgaa  | 1080 |
| ggggctttcc  | aatgctgggtg | tgaacacagg | tatgcaactac | ggcccgaccg  | gcgcgactgc  | 1140 |
| aaggctcttg  | ggccagagcc  | tgtgctgctg | ttcgccaatc  | gcatcgacat  | ccggcaggtg  | 1200 |
| ctgccacacc  | gctctgagta  | cacactgctg | cttaacaacc  | tgaggaaatgc | cattgccctt  | 1260 |
| gatttccacc  | accgccgcga  | gcttgtcttc | tggtcagatg  | tcacctgga   | ccggatcctc  | 1320 |
| cgtgccaaac  | tcaacggcag  | caacgtggag | gaggttgtgt  | ctactgggct  | ggagagccca  | 1380 |
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Asn Asp Cys Glu Asp Asp Ser Asp Glu Gln Asp Cys Pro Pro Arg Glu
          35          40          45
Cys Glu Glu Asp Glu Phe Pro Cys Gln Asn Gly Tyr Cys Ile Arg Ser
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Leu Trp His Cys Asp Gly Asp Asn Asp Cys Gly Asp Asn Ser Asp Glu  
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 Gln Cys Asp Met Arg Lys Cys Ser Asp Lys Glu Phe Arg Cys Ser Asp  
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 Gly Ser Cys Ile Ala Glu His Trp Tyr Cys Asp Gly Asp Thr Asp Cys  
 100 105 110  
 Lys Asp Gly Ser Asp Glu Glu Asn Cys Pro Ser Ala Val Pro Ala Pro  
 115 120 125  
 Pro Cys Asn Leu Glu Glu Phe Gln Cys Ala Tyr Gly Arg Cys Ile Leu  
 130 135 140  
 Asp Ile Tyr His Cys Asp Gly Asp Asp Asp Cys Gly Asp Trp Ser Asp  
 145 150 155 160  
 Glu Ser Asp Cys Cys Glu Tyr Ser Gly Gln Leu Gly Ala Ser His Gln  
 165 170 175  
 Pro Cys Arg Ser Gly Glu Phe Met Cys Asp Ser Gly Leu Cys Ile Asn  
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 Ala Gly Trp Arg Cys Asp Gly Asp Ala Asp Cys Asp Asp Gln Ser Asp  
 195 200 205  
 Glu Arg Asn Cys Thr Thr Ser Met Cys Thr Ala Glu Gln Phe Arg Cys  
 210 215 220  
 His Ser Gly Arg Cys Val Arg Leu Ser Trp Arg Cys Asp Gly Glu Asp  
 225 230 235 240  
 Asp Cys Ala Asp Asn Ser Asp Glu Glu Asn Cys Glu Asn Thr Gly Ser  
 245 250 255  
 Pro Gln Cys Ala Leu Asp Gln Phe Leu Cys Trp Asn Gly Arg Cys Ile  
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 Gly Gln Arg Lys Leu Cys Asn Gly Val Asn Asp Cys Gly Asp Asn Ser  
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 Asp Glu Ser Pro Gln Gln Asn Cys Arg Pro Arg Thr Gly Glu Glu Asn  
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 Cys Asn Val Asn Asn Gly Gly Cys Ala Gln Lys Cys Gln Met Val Arg  
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 Gly Ala Val Gln Cys Thr Cys His Thr Gly Tyr Arg Leu Thr Glu Asp  
 325 330 335  
 Gly His Thr Cys Gln Asp Val Asn Glu Cys Ala Glu Glu Gly Tyr Cys  
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Thr Gly Tyr Glu Leu Arg Pro Asp Arg Arg Ser Cys Lys Ala Leu Gly  
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 Ala Ile Ala Leu Asp Phe His His Arg Arg Glu Leu Val Phe Trp Ser  
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 450 455 460  
 Val Asp Trp Val His Asp Lys Leu Tyr Trp Thr Asp Ser Gly Thr Ser  
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 Trp Gln Asn Leu Glu Lys Pro Arg Ala Ile Ala Leu His Pro Met Glu  
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 Gly Thr Ile Tyr Trp Thr Asp Trp Gly Asn Thr Pro Arg Ile Glu Ala  
 515 520 525  
 Ser Ser Met Asp Gly Ser Gly Arg Arg Ile Ile Ala Asp Thr His Leu  
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 Phe Trp Pro Asn Gly Leu Thr Ile Asp Tyr Ala Gly Arg Arg Met Tyr  
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 Ser His Arg Lys Ala Val Ile Ser Gln Gly Leu Pro His Pro Phe Ala  
 580 585 590  
 Ile Thr Val Phe Glu Asp Ser Leu Tyr Trp Thr Asp Trp His Thr Lys  
 595 600 605  
 Ser Ile Asn Ser Ala Asn Lys Phe Thr Gly Lys Asn Gln Glu Ile Ile  
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 Arg Asn Lys Leu His Phe Pro Met Asp Ile His Thr Leu His Pro Gln  
 625 630 635 640  
 Arg Gln Pro Ala Gly Lys Asn Arg Cys Gly Asp Asn Asn Gly Gly Cys  
 645 650 655  
 Thr His Leu Cys Leu Pro Ser Gly Gln Asn Tyr Thr Cys Ala Cys Pro  
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|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Gly | Phe | Arg | Lys | Ile | Ser | Ser | His | Ala | Cys | Ala | Gln | Ser | Leu | Asp | 675 | 680 | 685 |
| Lys | Phe | Leu | Leu | Phe | Ala | Arg | Arg | Met | Asp | Ile | Arg | Arg | Ile | Ser | Phe | 690 | 695 | 700 |
| Asp | Thr | Glu | Asp | Leu | Ser | Asp | Asp | Val | Ile | Pro | Leu | Ala | Asp | Val | Arg | 705 | 710 | 715 |
| Ser | Ala | Val | Ala | Leu | Asp | Trp | Asp | Ser | Arg | Asp | Asp | His | Val | Tyr | Trp | 725 | 730 | 735 |
| Thr | Asp | Val | Ser | Thr | Asp | Thr | Ile | Ser | Arg | Ala | Lys | Trp | Asp | Gly | Thr | 740 | 745 | 750 |
| Gly | Gln | Glu | Val | Val | Val | Asp | Thr | Ser | Leu | Glu | Ser | Pro | Ala | Gly | Leu | 755 | 760 | 765 |
| Ala | Ile | Asp | Trp | Val | Thr | Asn | Lys | Leu | Tyr | Trp | Thr | Asp | Ala | Gly | Thr | 770 | 775 | 780 |
| Asp | Arg | Ile | Glu | Val | Ala | Asn | Thr | Asp | Gly | Ser | Met | Arg | Thr | Val | Leu | 785 | 790 | 795 |
| Ile | Trp | Glu | Asn | Leu | Asp | Arg | Pro | Arg | Asp | Ile | Val | Val | Glu | Pro | Met | 805 | 810 | 815 |
| Gly | Gly | Tyr | Met | Tyr | Trp | Thr | Asp | Trp | Gly | Ala | Ser | Pro | Lys | Ile | Glu | 820 | 825 | 830 |
| Arg | Ala | Gly | Met | Asp | Ala | Ser | Gly | Arg | Gln | Val | Ile | Ile | Ser | Ser | Asn | 835 | 840 | 845 |
| Leu | Thr | Trp | Pro | Asn | Gly | Leu | Ala | Ile | Asp | Tyr | Gly | Ser | Gln | Arg | Leu | 850 | 855 | 860 |
| Tyr | Trp | Ala | Asp | Ala | Gly | Met | Lys | Thr | Ile | Glu | Phe | Ala | Gly | Leu | Asp | 865 | 870 | 875 |
| Gly | Ser | Lys | Arg | Lys | Val | Leu | Ile | Gly | Ser | Gln | Leu | Pro | His | Pro | Phe | 885 | 890 | 895 |
| Gly | Leu | Thr | Leu | Tyr | Gly | Glu | Arg | Ile | Tyr | Trp | Thr | Asp | Trp | Gln | Thr | 900 | 905 | 910 |
| Lys | Ser | Ile | Gln | Ser | Ala | Asp | Arg | Leu | Thr | Gly | Leu | Asp | Arg | Glu | Thr | 915 | 920 | 925 |
| Leu | Gln | Glu | Asn | Leu | Glu | Asn | Leu | Met | Asp | Ile | His | Val | Phe | His | Arg | 930 | 935 | 940 |
| Arg | Arg | Pro | Pro | Val | Ser | Thr | Pro | Cys | Ala | Met | Glu | Asn | Gly | Gly | Cys | 945 | 950 | 955 |
| Ser | His | Leu | Cys | Leu | Arg | Ser | Pro | Asn | Pro | Ser | Gly | Phe | Ser | Cys | Thr | 965 | 970 | 975 |

Cys Pro Thr Gly Ile Asn Leu Leu Ser Asp Gly Lys Thr Cys Ser Pro  
 980 985 990  
 Gly Met Asn Ser Phe Leu Ile Phe Ala Arg Arg Ile Asp Ile Arg Met  
 995 1000 1005  
 Val Ser Leu Asp Ile Pro Tyr Phe Ala Asp Val Val Val Pro Ile Asn  
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 Arg Lys Val Leu Val Trp Gln Asn Leu Asp Ser Pro Arg Ala Ile Val  
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 Thr Arg Arg Ile Tyr Trp Val Asp Ala His Leu Asp Arg Ile Glu Ser  
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 1795 1800 1805  
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 35 40 45  
 Gly Gly Phe Leu Gly Ile Asn Met Glu Ile Thr Gly Pro Lys Asn Lys  
 50 55 60  
 Arg Ile Tyr Lys Gly Asp Lys Glu Ser Ser Gly Lys Tyr Thr Phe Ser  
 65 70 75 80  
 Ala His Met Asp Gly Thr Asn Thr Phe Cys Phe Ser Asp Arg Val Ser  
 85 90 95  
 Thr Met Thr Pro Lys Ile Val Ile Phe Thr Ile Asp Ile Gly Glu Ala  
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 Glu Glu Tyr Thr Lys Ile Trp Glu Arg Ile His Arg Ala Ile Ser Asp  
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 tctcacctgc ggttctggct gatccagggc gtgtgcgtcc tcctccccctc cgccgtcttc 240  
 agcgtctatg tcctgcaccg aggagccacg ctcgccgcgc tgggcccccg ccgtgcccc 300  
 gacccccggg agccggcctc cgggcagaga cgctgccccg ggccattcgg ggagcgcggc 360  
 ggcctccagg tgcccgactt ttcggccggc tacatcatcc acctcctcct ccggaccctg 420  
 ctggaggcag ccttcggggc cttgcactac tttctctttg gattcctggc cccgaagaag 480  
 ttcccttgca cgcgccccctc gtgcacgggc gtgggtggact gctacgtgtc gcggcccaca 540  
 gagaagtccc tgctgatgct gttcctctgg gcggtcagcg cgctgtcttt tctgctgggc 600  
 ctgcgcgacc tgggtctgcag cctgcggcgg cggatgcgca ggaggccggg accccccaca 660  
 agccccctca tccggaagca gagcggagcc tcaggccacg cggagggacg ccggactgac 720  
 gaggaggggtg ggcgggagga agagggggca ccggcgcccc cgggtgcacg cgccggaggg 780  
 gagggggctg gcagccccag gcgtacatcc aggggtgtcag ggcacacgaa gattccggat 840  
 gaggatgaga gtgaggtgac atcctccgcc agcgaaaagc tgggcagaca gccccggggc 900  
 aggccccacc gagaggccgc ccaggacccc agggggtcag gatccgagga gcagccctca 960  
 gcagccccca gccgcctggc cgcgccccct tcctgcagca gcctgcagcc ccctgacctc 1020  
 cctgccagct ccagtgggtg tccccacctg agagccagga agtctgagtg ggtgtgaaaa 1080  
 aaacagcacc tggcggtgcc ccggggctca cgcctgtaat 1120

<210> 64  
 <211> 356  
 <212> PRT  
 <213> Homo sapiens

<400> 64  
 Met Pro Ala Ser Ser Leu Pro Gly Lys Leu Trp Phe Val Leu Thr Met  
 1 5 10 15  
 Leu Leu Arg Met Leu Val Ile Val Leu Ala Gly Arg Pro Val Tyr Gln  
 20 25 30  
 Asp Glu Gln Glu Arg Phe Val Cys Asn Thr Leu Gln Pro Gly Cys Ala  
 35 40 45  
 Asn Val Cys Tyr Asp Val Phe Ser Pro Val Ser His Leu Arg Phe Trp  
 50 55 60  
 Leu Ile Gln Gly Val Cys Val Leu Leu Pro Ser Ala Val Phe Ser Val  
 65 70 75 80  
 Tyr Val Leu His Arg Gly Ala Thr Leu Ala Ala Leu Gly Pro Arg Arg  
 85 90 95  
 Cys Pro Asp Pro Arg Glu Pro Ala Ser Gly Gln Arg Arg Cys Pro Arg  
 100 105 110



Pro Phe Gly Glu Arg Gly Gly Leu Gln Val Pro Asp Phe Ser Ala Gly  
 115 120 125  
 Tyr Ile Ile His Leu Leu Leu Arg Thr Leu Leu Glu Ala Ala Phe Gly  
 130 135 140  
 Ala Leu His Tyr Phe Leu Phe Gly Phe Leu Ala Pro Lys Lys Phe Pro  
 145 150 155 160  
 Cys Thr Arg Pro Pro Cys Thr Gly Val Val Asp Cys Tyr Val Ser Arg  
 165 170 175  
 Pro Thr Glu Lys Ser Leu Leu Met Leu Phe Leu Trp Ala Val Ser Ala  
 180 185 190  
 Leu Ser Phe Leu Leu Gly Leu Ala Asp Leu Val Cys Ser Leu Arg Arg  
 195 200 205  
 Arg Met Arg Arg Arg Pro Gly Pro Pro Thr Ser Pro Ser Ile Arg Lys  
 210 215 220  
 Gln Ser Gly Ala Ser Gly His Ala Glu Gly Arg Arg Thr Asp Glu Glu  
 225 230 235 240  
 Gly Gly Arg Glu Glu Glu Gly Ala Pro Ala Pro Pro Gly Ala Arg Ala  
 245 250 255  
 Gly Gly Glu Gly Ala Gly Ser Pro Arg Arg Thr Ser Arg Val Ser Gly  
 260 265 270  
 His Thr Lys Ile Pro Asp Glu Asp Glu Ser Glu Val Thr Ser Ser Ala  
 275 280 285  
 Ser Glu Lys Leu Gly Arg Gln Pro Arg Gly Arg Pro His Arg Glu Ala  
 290 295 300  
 Ala Gln Asp Pro Arg Gly Ser Gly Ser Glu Glu Gln Pro Ser Ala Ala  
 305 310 315 320  
 Pro Ser Arg Leu Ala Ala Pro Pro Ser Cys Ser Ser Leu Gln Pro Pro  
 325 330 335  
 Asp Pro Pro Ala Ser Ser Ser Gly Ala Pro His Leu Arg Ala Arg Lys  
 340 345 350  
 Ser Glu Trp Val  
 355

<210> 65  
 <211> 1234  
 <212> DNA  
 <213> Homo sapiens

<400> 65  
 taataatcctt tttttaaaac tccctaacag gatgtgtggc aggttcctga ggtgggtggct 60  
 gctggcggag gagagctggc actccacccc cgtggggcgc ctctgtttc cgtgctcct 120

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gggattccgc cttgtgctgc tggctgccag tgggcctgga gtctatggcg atgagcagag 180
tgaattcgtg tgtcacaccc agcagccggg ctgcaaggct gcctgcttcg atgccttcca 240
cccgtctctc ccgctgcgtt tctgggtctt ccaggctcatc ttggtggctg tacctagcgt 300
cctctacatg ggtttcactc tgtatcacgt gatctggcac tgggaagaat caagaaaggg 360
gacggaggaa gaggacaccc tgatccaggg aggggagagc agcagagata ccccaggggc 420
tggaagcctc aggctgctcc gagcttatgt ggctcagctg ggagctcagc tggtcctgga 480
ggggacagcg ccggggttgc agtaccacct gtatgggttc cagatgccca gtccttttgc 540
atgtggccaa gagccttgcc cgtatagatt aacttgccacc ttttcccacc cctcggagaa 600
gatcatcttt ctaaaagcca tgtttggggt cagtgggttc cgtctcttgt tcaactcttt 660
ggagattgtg cttctgggtc tgggaagact gtgtaagccc ctgcggaact tcctgggttg 720
ggcctcttcc tccagccacg ccctggccct gagcagcaaa aggaacctcc agcagacact 780
gggagccatc catcggcctg gtcagccttg ttccatttca gagaccatgt tccccacagc 840
cccagtgact aggggtgaca tctcccagacc tccccacct gtggatatgg ccaagtcgag 900
gtaccggtta accaaagatg ctgaaggagt gaagaaccag ccatccccta atacgcagga 960
tggttatatt gattatgtca aactgaaaac tttggagaaa ctcctctctc agaaagcgat 1020
aactgggcca gacacggtgg ctcatgcctg taatcccagc attttgggag gcctaggcag 1080
gtggatcact ggaggtcagg agttcaagac cagccaggcc aacatggtga aaccctgtgc 1140
tactaaaact acaaaaattc tgggcatggt ggtgggcgtc tgtaatccca gctacttgag 1200
aggctgagggc aggagaattg cttgaacctg ggag                                     1234

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<210> 66
<211> 391
<212> PRT
<213> Homo sapiens

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<400> 66
Met Cys Gly Arg Phe Leu Arg Trp Trp Leu Leu Ala Glu Glu Ser Trp
 1             5             10            15

His Ser Thr Pro Val Gly Arg Leu Leu Phe Pro Val Leu Leu Gly Phe
      20             25             30

Arg Leu Val Leu Leu Ala Ala Ser Gly Pro Gly Val Tyr Gly Asp Glu
      35             40             45

Gln Ser Glu Phe Val Cys His Thr Gln Gln Pro Gly Cys Lys Ala Ala
      50             55             60

Cys Phe Asp Ala Phe His Pro Leu Ser Pro Leu Arg Phe Trp Val Phe
      65             70             75            80

Gln Val Ile Leu Val Ala Val Pro Ser Val Leu Tyr Met Gly Phe Thr
      85             90            95

Leu Tyr His Val Ile Trp His Trp Glu Glu Ser Arg Lys Gly Thr Glu
      100            105            110

Glu Glu Asp Thr Leu Ile Gln Gly Gly Glu Ser Ser Arg Asp Thr Pro
      115            120            125

Gly Ala Gly Ser Leu Arg Leu Leu Arg Ala Tyr Val Ala Gln Leu Gly
      130            135            140

Ala Gln Leu Val Leu Glu Gly Thr Ala Pro Gly Leu Gln Tyr His Leu
      145            150            155            160

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Tyr Gly Phe Gln Met Pro Ser Ser Phe Ala Cys Gly Gln Glu Pro Cys  
 165 170 175  
 Pro Tyr Arg Leu Thr Cys Thr Phe Ser His Pro Ser Glu Lys Ile Ile  
 180 185 190  
 Phe Leu Lys Ala Met Phe Gly Val Ser Gly Phe Arg Leu Leu Phe Thr  
 195 200 205  
 Leu Leu Glu Ile Val Leu Leu Gly Leu Gly Arg Leu Cys Lys Pro Leu  
 210 215 220  
 Arg Asn Phe Leu Gly Gly Ala Ser Ser Ser Ser His Ala Leu Ala Leu  
 225 230 235 240  
 Ser Ser Lys Arg Asn Leu Gln Gln Thr Leu Gly Ala Ile His Arg Pro  
 245 250 255  
 Gly Gln Pro Cys Ser Ile Ser Glu Thr Met Phe Pro Thr Ala Pro Val  
 260 265 270  
 Thr Arg Gly Asp Ile Ser Arg Pro Pro Pro Pro Val Asp Met Ala Lys  
 275 280 285  
 Ser Arg Tyr Arg Leu Thr Lys Asp Ala Glu Gly Val Lys Asn Gln Pro  
 290 295 300  
 Ser Pro Asn Thr Gln Asp Gly Tyr Ile Asp Tyr Val Lys Leu Lys Thr  
 305 310 315 320  
 Leu Glu Lys Leu Leu Ser Gln Lys Ala Ile Thr Gly Pro Asp Thr Val  
 325 330 335  
 Ala His Ala Cys Asn Pro Ser Ile Leu Gly Gly Leu Gly Arg Trp Ile  
 340 345 350  
 Thr Gly Gly Gln Glu Phe Lys Thr Ser Gln Ala Asn Met Val Lys Pro  
 355 360 365  
 Val Ser Thr Lys Thr Thr Lys Ile Leu Gly Met Val Val Gly Val Cys  
 370 375 380  
 Asn Pro Ser Tyr Leu Arg Gly  
 385 390

<210> 67  
 <211> 1400  
 <212> DNA  
 <213> Homo sapiens

<400> 67  
 attctcccca aacgccaggg atgggggtca tggctccccg aaccctcctc ctgctgctct 60  
 tgggggcccct ggccctgacc gagacctggg ccggtgagtg cggggtcggg agggaaaggg 120  
 cctctgcggg gagaagcgag tggcccggc ggcccgggga gccgcgcctc agcctctcct 180  
 cgcctccagg ctccactcc ttgaggtatt tcagcaccgc agtgtcccag cccggccgcg 240  
 gggagccccg gttcatcgcc gtgggctacg tggacgacac agagtctgtg cggttcgaca 300

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gcgactccgt gagtccgagg atggagcggc gggcgccgtg ggtggagcag gaggggctgg 360
agtattggga ccaggagaca cggaacgcca agggccacgc gcagatttac cgagtgaacc 420
tgcggaaccct gtcctcgctat tacaaccaga gcgaggccgg tggttctcac accatccaga 480
ggaagcatga ctgcgacgtg ggcccgacag gcgggcccga caggcgccctc ctccgcaggt 540
atgaacagtt cgcctacgat ggcaaggatt acatcgccct gaacgaggac ctgccctcct 600
ggaccgccgc gaacacagcg gctcagatct ccagacaca gtgggaagcg gacaaatact 660
cagagcaggt cagggcctac ctgagggcaa gtgcatggag tggcgagggc aagtgcattg 720
agtggctccg cagacacctg gagaacggga aggagacgct gcagcgcgcg tcagatcccc 780
caaaggcaca tgtgacccag caccctgtct ctgacctga ggccaccctt gaggtgctgg 840
gccctgggcc tctacccttg aggtgctggg ccctgggctt ctaccctgcg gagatcacac 900
tgacctggca gcaggatggg gaggaccaga ccaggacac ggagcttggt gagaccaggc 960
ctgcagggga cggaaccttc cagaagtggg tggctgtagt ggtgccttcc ggagaggagc 1020
agagatacat gtgccatgtg cagcatgagg ggctgccaga gcccctcacc ctgagatggc 1080
cctcacctcc ctctcctttc ccagagccgt cttctcagcc caccatcccc atcgtgggca 1140
tcgttgctgg cctgtttctc cttggagctg tggctactgg agctgtggtt gctgctgtga 1200
tgaagaggaa gaaaagctca ggtagggaag ggtgagagg tgggatctgg gttttcttgt 1260
tccactgtgg gtttcaagcc acaggtagaa ttgtgacttg cttcatcact gggaagcacc 1320
gtccacacac aggccgacct agcctggggc cctgtgtgcc aacacttgct cttttgtgaa 1380
gcacatgtga aaacgaagga                                     1400

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<210> 68  
 <211> 452  
 <212> PRT  
 <213> Homo sapiens

```

<400> 68
Met Gly Val Met Ala Pro Arg Thr Leu Leu Leu Leu Leu Gly Ala
  1                      5                      10          15

Leu Ala Leu Thr Glu Thr Trp Ala Gly Glu Cys Gly Val Gly Arg Glu
      20                      25          30

Arg Ala Ser Ala Gly Arg Ser Glu Trp Pro Ala Arg Pro Gly Glu Pro
      35                      40          45

Arg Leu Ser Leu Ser Ser Pro Pro Gly Ser His Ser Leu Arg Tyr Phe
      50                      55          60

Ser Thr Ala Val Ser Gln Pro Gly Arg Gly Glu Pro Arg Phe Ile Ala
      65                      70          75          80

Val Gly Tyr Val Asp Asp Thr Glu Phe Val Arg Phe Asp Ser Asp Ser
      85                      90          95

Val Ser Pro Arg Met Glu Arg Arg Ala Pro Trp Val Glu Gln Glu Gly
      100                     105          110

Leu Glu Tyr Trp Asp Gln Glu Thr Arg Asn Ala Lys Gly His Ala Gln
      115                     120          125

Ile Tyr Arg Val Asn Leu Arg Thr Leu Leu Arg Tyr Tyr Asn Gln Ser
      130                     135          140

Glu Ala Gly Gly Ser His Thr Ile Gln Arg Lys His Asp Cys Asp Val
      145                     150          155          160

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Gly Pro Thr Gly Gly Pro Asp Arg Arg Leu Leu Arg Arg Tyr Glu Gln  
 165 170 175  
 Phe Ala Tyr Asp Gly Lys Asp Tyr Ile Ala Leu Asn Glu Asp Leu Pro  
 180 185 190  
 Ser Trp Thr Ala Ala Asn Thr Ala Ala Gln Ile Ser Gln His Lys Trp  
 195 200 205  
 Glu Ala Asp Lys Tyr Ser Glu Gln Val Arg Ala Tyr Leu Arg Ala Ser  
 210 215 220  
 Ala Trp Ser Gly Glu Gly Lys Cys Met Glu Trp Leu Arg Arg His Leu  
 225 230 235 240  
 Glu Asn Gly Lys Glu Thr Leu Gln Arg Ala Ser Asp Pro Pro Lys Ala  
 245 250 255  
 His Val Thr Gln His Pro Val Ser Asp His Glu Ala Thr Leu Glu Val  
 260 265 270  
 Leu Gly Pro Gly Pro Leu Pro Leu Arg Cys Trp Ala Leu Gly Leu Tyr  
 275 280 285  
 Pro Ala Glu Ile Thr Leu Thr Trp Gln Gln Asp Gly Glu Asp Gln Thr  
 290 295 300  
 Gln Asp Thr Glu Leu Val Glu Thr Arg Pro Ala Gly Asp Gly Thr Phe  
 305 310 315 320  
 Gln Lys Trp Val Ala Val Val Val Pro Ser Gly Glu Glu Gln Arg Tyr  
 325 330 335  
 Met Cys His Val Gln His Glu Gly Leu Pro Glu Pro Leu Thr Leu Arg  
 340 345 350  
 Trp Pro Ser Pro Pro Ser Pro Phe Pro Glu Pro Ser Ser Gln Pro Thr  
 355 360 365  
 Ile Pro Ile Val Gly Ile Val Ala Gly Leu Phe Leu Leu Gly Ala Val  
 370 375 380  
 Val Thr Gly Ala Val Val Ala Ala Val Met Lys Arg Lys Lys Ser Ser  
 385 390 395 400  
 Gly Arg Glu Gly Val Arg Gly Gly Ile Trp Val Phe Leu Phe His Cys  
 405 410 415  
 Gly Phe Gln Ala Thr Gly Arg Ile Val Thr Cys Phe Ile Thr Gly Lys  
 420 425 430  
 His Arg Pro His Thr Gly Arg Pro Ser Leu Gly Pro Cys Val Pro Thr  
 435 440 445  
 Leu Ala Leu Leu  
 450

<210> 69  
 <211> 1225  
 <212> DNA  
 <213> Homo sapiens

<400> 69  
 acgccgagga tgggggtcatg gcgtcccaaa cctcctcct gctgctcttg ggggccctgg 60  
 ccctgaccga gacctgggcg ggtaccact ccataaggta tttcagcacc gccgtgtccc 120  
 ggccgggctc cggggagccc cggggtagcc actccataag gtatttcagc accgccgtgt 180  
 cccggccggg tcgcggggag ccccggtaca tcgcagtggg ctacgtggac gacacgcagt 240  
 tcgtgcggtt cgacagcgac gcggcgactc cgaggatgga gccgcaggcg ccgtgggttg 300  
 agcaggaggg accggagtat tgggaccgga gcacaccgaa catcaggccc gcgcacagac 360  
 tgacaagagt gaacctgccc atgccgcgcc gctactacca ccagagcggg tctaacaccc 420  
 tccagataat gtatggctgc gacttggggc tgggaaggcg cctcctccgc gggatgaac 480  
 agcacgcaa cgatggcaaa gattacatcg ccctaaacga ggacctgagc tcttgaccg 540  
 cggcgcccat ggcggctcag attaccagc gcaagtggga ggcggcccat gaggcggagc 600  
 agcagagagc ctacctggag ggcacgtgcg tggagtggct ccgcagatac ctggagaacg 660  
 ggaaggagac gctgcagcgc actaccccc ccccaagac acatatgatc caccattccg 720  
 tctctgacta taaggccacc ctgagatgct gggccctggg cttctaccct gtggagatca 780  
 cactgacctg gcagcaggat ggagaggacc agactcagga catggagctt gtagagacca 840  
 ggcctgcagg ggatggaaac ttccagaagt ggcagctgt ggtggtgcct tctggagagg 900  
 aacagagata catgtgccat gtgcagcatg aggggttgcc caagcccctc accctgagat 960  
 gggagcagtc ttctcagccc accatcccca tcgtgggtat cgttgctggc ctggttctcc 1020  
 ttggagctgt agtcaactgga gctgtggttt ctgctgtgat gtgcaggaag aactcatttt 1080  
 gttctacccc aggcagcaac catgcgcagg gttctgatgt gtctctcacg gcttgtaaag 1140  
 gtgagacgct gggggacctg atgtgtgggg ggtgttgggg gcaatagtgg atgcagctgt 1200  
 gctatggggt ttctttgaat tggat 1225

<210> 70  
 <211> 389  
 <212> PRT  
 <213> Homo sapiens

<400> 70  
 Met Ala Ser Gln Thr Leu Leu Leu Leu Leu Gly Ala Leu Ala Leu  
 1 5 10 15  
 Thr Glu Thr Trp Ala Gly Thr His Ser Ile Arg Tyr Phe Ser Thr Ala  
 20 25 30  
 Val Ser Arg Pro Gly Arg Gly Glu Pro Arg Gly Thr His Ser Ile Arg  
 35 40 45  
 Tyr Phe Ser Thr Ala Val Ser Arg Pro Gly Arg Gly Glu Pro Arg Tyr  
 50 55 60  
 Ile Ala Val Gly Tyr Val Asp Asp Thr Gln Phe Val Arg Phe Asp Ser  
 65 70 75 80  
 Asp Ala Ala Thr Pro Arg Met Glu Pro Gln Ala Pro Trp Leu Glu Gln  
 85 90 95  
 Glu Gly Pro Glu Tyr Trp Asp Arg Ser Thr Pro Asn Ile Arg Pro Ala  
 100 105 110

His Arg Leu Thr Arg Val Asn Leu Pro Met Pro Arg Arg Tyr Tyr His  
 115 120 125  
 Gln Ser Gly Ser Asn Thr Leu Gln Ile Met Tyr Gly Cys Asp Leu Gly  
 130 135 140  
 Leu Glu Gly Arg Leu Leu Arg Gly Tyr Glu Gln His Ala Asn Asp Gly  
 145 150 155 160  
 Lys Asp Tyr Ile Ala Leu Asn Glu Asp Leu Ser Ser Trp Thr Ala Ala  
 165 170 175  
 Ala Met Ala Ala Gln Ile Thr Gln Arg Lys Trp Glu Ala Ala His Glu  
 180 185 190  
 Ala Glu Gln Gln Arg Ala Tyr Leu Glu Gly Thr Cys Val Glu Trp Leu  
 195 200 205  
 Arg Arg Tyr Leu Glu Asn Gly Lys Glu Thr Leu Gln Arg Thr Thr Pro  
 210 215 220  
 Pro Pro Lys Thr His Met Ile His His Ser Val Ser Asp Tyr Lys Ala  
 225 230 235 240  
 Thr Leu Arg Cys Trp Ala Leu Gly Phe Tyr Pro Val Glu Ile Thr Leu  
 245 250 255  
 Thr Trp Gln Gln Asp Gly Glu Asp Gln Thr Gln Asp Met Glu Leu Val  
 260 265 270  
 Glu Thr Arg Pro Ala Gly Asp Gly Asn Phe Gln Lys Trp Ala Ala Val  
 275 280 285  
 Val Val Pro Ser Gly Glu Glu Gln Arg Tyr Met Cys His Val Gln His  
 290 295 300  
 Glu Gly Leu Pro Lys Pro Leu Thr Leu Arg Trp Glu Gln Ser Ser Gln  
 305 310 315 320  
 Pro Thr Ile Pro Ile Val Gly Ile Val Ala Gly Leu Val Leu Leu Gly  
 325 330 335  
 Ala Val Val Thr Gly Ala Val Val Ser Ala Val Met Cys Arg Lys Asn  
 340 345 350  
 Ser Phe Cys Ser Thr Pro Gly Ser Asn His Ala Gln Gly Ser Asp Val  
 355 360 365  
 Ser Leu Thr Ala Cys Lys Gly Glu Thr Leu Gly Asp Leu Met Cys Gly  
 370 375 380  
 Gly Cys Trp Gly Gln  
 385

<210> 71  
 <211> 1159

<212> DNA

<213> Homo sapiens

<400> 71

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ggggccctga cccagacctg ggcgcgttcc cactccatga ggtatttcta caccaccatg 120
tcccgggccc gccgcgggga gccccgcttc atctccgtcg gctacgtgga ctatacgag 180
ttcgtgcggt tcgacagcga cgacgcgagt ccgagagagg agccgcgggc gccgtggatg 240
gagcgggagg ggccggagta ttgggaccgg aacacacaga tctgcaaggc ccaagcacgg 300
actgaacgag agaacctgcg gatcgcgctc cgctactaca accagagcga gggcgggtgg 360
tcccacacca tgcaggtgat gtatggctgc gacgtggggc ccgacgggag cttcctccgc 420
gggtatgaac agcacgccta cgacggcaag gattacatcg ctctgaacga ggacctgcgc 480
tcctggaccg cggcggacat ggcagctcag atcaccaagc gcaagtggga ggcggcccgt 540
gtggcggagc agctgagagc ctacctggag ggcgagttcg tggagtggct ccgcagatac 600
ctggagaacg ggaaggagac gctgcagcgc gcgtcagacc cccccaagac acatatgacc 660
cactacccca tctctgacca tgaggccacc ctgaggtgct gggccctggg cttctaccct 720
gcggagatca cactgacctg gcagcgggat ggggaggacc agaccacgga gctcgtggag 780
accaggcctg caggggatgg aaccttccag aagtgggcgg ctgtggtggg gccttctgga 840
gaggagcaga gatacacctg ccatgtgcag catgagggtc tgcccagacc cctcaccctg 900
agatggcagg gtcaggggtcc ctcaccttcc ccccttttcc cagagccatc ttcccagccc 960
accatcccca tcgtgggcat cattgctggc ctgggttctac ttgtagctgt ggtcactgga 1020
gctgtggtca ctgctgtaat gtggaggaag aagagctcag gtaaggaagg ggatgggtat 1080
tctactccag gcggcaacag tgcccagggc tctgatgtgt ctctcacggc gtgaaagggtg 1140
agaccttggg gggcctgat                                     1159
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<210> 72

<211> 371

<212> PRT

<213> Homo sapiens

<400> 72

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Met Val Leu Met Ala Pro Arg Thr Leu Leu Leu Leu Leu Ser Gly Ala
  1                      5                      10                      15

Leu Thr Gln Thr Trp Ala Arg Ser His Ser Met Arg Tyr Phe Tyr Thr
      20                      25                      30

Thr Met Ser Arg Pro Gly Arg Gly Glu Pro Arg Phe Ile Ser Val Gly
      35                      40                      45

Tyr Val Asp Tyr Thr Gln Phe Val Arg Phe Asp Ser Asp Asp Ala Ser
      50                      55                      60

Pro Arg Glu Glu Pro Arg Ala Pro Trp Met Glu Arg Glu Gly Pro Glu
      65                      70                      75                      80

Tyr Trp Asp Arg Asn Thr Gln Ile Cys Lys Ala Gln Ala Arg Thr Glu
      85                      90                      95

Arg Glu Asn Leu Arg Ile Ala Leu Arg Tyr Tyr Asn Gln Ser Glu Gly
      100                      105                      110

Gly Gly Ser His Thr Met Gln Val Met Tyr Gly Cys Asp Val Gly Pro
      115                      120                      125

Asp Gly Arg Phe Leu Arg Gly Tyr Glu Gln His Ala Tyr Asp Gly Lys
```



| 130  | 135 | 140 |
|--|-----|-----|
| Asp Tyr Ile Ala Leu Asn Glu Asp Leu Arg Ser Trp Thr Ala Ala Asp<br>145 150 155 160 |     |     |
| Met Ala Ala Gln Ile Thr Lys Arg Lys Trp Glu Ala Ala Arg Val Ala<br>165 170 175     |     |     |
| Glu Gln Leu Arg Ala Tyr Leu Glu Gly Glu Phe Val Glu Trp Leu Arg<br>180 185 190     |     |     |
| Arg Tyr Leu Glu Asn Gly Lys Glu Thr Leu Gln Arg Ala Ser Asp Pro<br>195 200 205     |     |     |
| Pro Lys Thr His Met Thr His Tyr Pro Ile Ser Asp His Glu Ala Thr<br>210 215 220     |     |     |
| Leu Arg Cys Trp Ala Leu Gly Phe Tyr Pro Ala Glu Ile Thr Leu Thr<br>225 230 235 240 |     |     |
| Trp Gln Arg Asp Gly Glu Asp Gln Thr Thr Glu Leu Val Glu Thr Arg<br>245 250 255     |     |     |
| Pro Ala Gly Asp Gly Thr Phe Gln Lys Trp Ala Ala Val Val Val Pro<br>260 265 270     |     |     |
| Ser Gly Glu Glu Gln Arg Tyr Thr Cys His Val Gln His Glu Gly Leu<br>275 280 285     |     |     |
| Pro Glu Pro Leu Thr Leu Arg Trp Gln Gly Gln Gly Pro Ser Pro Ser<br>290 295 300     |     |     |
| Pro Leu Phe Pro Glu Pro Ser Ser Gln Pro Thr Ile Pro Ile Val Gly<br>305 310 315 320 |     |     |
| Ile Ile Ala Gly Leu Val Leu Leu Val Ala Val Val Thr Gly Ala Val<br>325 330 335     |     |     |
| Val Thr Ala Val Met Trp Arg Lys Lys Ser Ser Gly Lys Glu Gly Asp<br>340 345 350     |     |     |
| Gly Tyr Ser Thr Pro Gly Gly Asn Ser Ala Gln Gly Ser Asp Val Ser<br>355 360 365     |     |     |
| Leu Thr Ala<br>370   |     |     |

<210> 73  
 <211> 565  
 <212> DNA  
 <213> Homo sapiens

<400> 73  
 aggggaagca tgagacggct gcggatctcg ctggccccgt ggggtgggcgc gggggacgcg 60  
 ggagggggccg agctcacggg gccagcgcg gggcctgcag gtggccctgg aggaatctgc 120  
 aagcaccgcg ccgtgcagcg ggccttccgg gagaccagtg tggacagcgc cctggacacg 180

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cccttcccag ctggaacatc tgtgaggctg gaatttaagc tccggcagac aagcggctgg 240
aggaaggcct ggaagaaacc caagtgcaaa gcccagcccg agaggaggaa acagaaatgc 300
ctgacctgcg tcaaaatgga ctgtgaggat aaggttctgg gcaggatggt tcgctgccct 360
ccagagacgc agactcggcg ggagcctgag gagcaccagg gggccgggtg cagcccggcg 420
gagcggggcg ggaggacccc acggcgggag gggcggggag gacccacgg ctgccgcttc 480
cctgcacggg tcgcctcctc caaggcccg ccccgagcgg agccctagcg ctgaatcgca 540
tggcgcccc tggagccctg gcggg 565

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<210> 74
<211> 172
<212> PRT
<213> Homo sapiens

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<400> 74
Met Arg Arg Leu Arg Ile Ser Leu Ala Pro Trp Val Gly Ala Gly Asp
  1             5             10             15

Ala Gly Gly Ala Glu Leu Thr Gly Pro Ala Pro Gly Pro Ala Gly Gly
      20             25             30

Pro Gly Gly Ile Cys Lys His Pro Pro Val Gln Arg Ala Phe Arg Glu
      35             40             45

Thr Ser Val Asp Ser Ala Leu Asp Thr Pro Phe Pro Ala Gly Thr Ser
      50             55             60

Val Arg Leu Glu Phe Lys Leu Arg Gln Thr Ser Gly Trp Arg Lys Ala
      65             70             75             80

Trp Lys Lys Pro Lys Cys Lys Ala Gln Pro Glu Arg Arg Lys Gln Lys
      85             90             95

Cys Leu Thr Cys Val Lys Met Asp Cys Glu Asp Lys Val Leu Gly Arg
      100            105            110

Met Val Arg Cys Pro Pro Glu Thr Gln Thr Arg Arg Glu Pro Glu Glu
      115            120            125

His Gln Gly Ala Gly Cys Ser Pro Ala Glu Arg Ala Gly Arg Thr Pro
      130            135            140

Arg Arg Ser Gly Arg Gly Gly Pro His Gly Cys Arg Phe Pro Ala Arg
      145            150            155            160

Phe Ala Ser Ser Lys Ala Arg Pro Pro Ala Glu Pro
      165            170

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<210> 75
<211> 1706
<212> DNA
<213> Homo sapiens

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ctgaggtgcc ttatgcctct ggcatgcccc tcaagaaaac aggccatcga ggtgtcgatt 180
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taggcattac ttacactgtg gggagcctga gtaccaaacc agagcgtgat gtcctcatgc 300
aagatttcta cgtgggtggag agtatcttct tccccagtga agggagcaac ctgacccttg 360
ctcatcacta caatgccttc cgtttcaaga cctatgcgcc ggttgccttc cgctactttc 420
gggagctatt tggatatccc cccgatgatt acttgtgctc cctctgcagt gagccgctga 480
ttgaactctg tagctctgga gctagtgggt ccctgttcta tgtgtccagc gacgatgaac 540
tcattattaa gacactccaa cataaagagg cggagtttct gcagaagctg cttccaggat 600
actacttgaa cctcagccag aaccctcgga ctttgcctgc taaattcttt ggactgtact 660
gtgtgcagac aggtggcaag aacattcgga ttgtggtgat gaacaatctt ttaccaagat 720
ccgtcaaaat gcatatcaaa tatgacctca aaggctcaac ctacaaacgc cgggcttccc 780
agaaagagcg agagaagcct cttcccatat ttaaagatct agacttctta caagacatcc 840
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aacacaagtc acaagtgata aaggtgcaag tggagccagg tgttcacctt ggctgttctg 1500
atgttttacc tcagacctca gaatccacct ttggaggaaa tcagggaggg ctcactatta 1560
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ccttgaaaaa acttgaatgt acagagtcag agttcaccca ttaagcgcaa agcctcagaa 1680
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<210> 76
<211> 551
<212> PRT
<213> Homo sapiens

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<400> 76
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Phe Asp Pro Gly Ala Pro Ser Cys Thr Ala Ser Ser Ala Ser Gly Ile
  20             25             30

Leu Ser Pro Thr Ala Ser Glu Val Pro Tyr Ala Ser Gly Met Pro Ile
  35             40             45

Lys Lys Thr Gly His Arg Gly Val Asp Ser Ser Gly Glu Thr Thr Tyr
  50             55             60

Lys Lys Thr Thr Ser Thr Ala Leu Lys Gly Ala Ile Gln Leu Gly Ile
  65             70             75             80

Thr Tyr Thr Val Gly Ser Leu Ser Thr Lys Pro Glu Arg Asp Val Leu
  85             90             95

Met Gln Asp Phe Tyr Val Val Glu Ser Ile Phe Phe Pro Ser Glu Gly
 100             105             110

Ser Asn Leu Thr Pro Ala His His Tyr Asn Ala Phe Arg Phe Lys Thr

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| 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Tyr | Ala | Pro | Val | Ala | Phe | Arg | Tyr | Phe | Arg | Glu | Leu | Phe | Gly | Ile | Pro |
| 130 |     |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Pro | Asp | Asp | Tyr | Leu | Cys | Ser | Leu | Cys | Ser | Glu | Pro | Leu | Ile | Glu | Leu |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Cys | Ser | Ser | Gly | Ala | Ser | Gly | Ser | Leu | Phe | Tyr | Val | Ser | Ser | Asp | Asp |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Glu | Leu | Ile | Ile | Lys | Thr | Leu | Gln | His | Lys | Glu | Ala | Glu | Phe | Leu | Gln |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Lys | Leu | Leu | Pro | Gly | Tyr | Tyr | Leu | Asn | Leu | Ser | Gln | Asn | Pro | Arg | Thr |
|     |     |     | 195 |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Leu | Leu | Pro | Lys | Phe | Phe | Gly | Leu | Tyr | Cys | Val | Gln | Thr | Gly | Gly | Lys |
|     |     |     | 210 |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Asn | Ile | Arg | Ile | Val | Val | Met | Asn | Asn | Leu | Leu | Pro | Arg | Ser | Val | Lys |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Met | His | Ile | Lys | Tyr | Asp | Leu | Lys | Gly | Ser | Thr | Tyr | Lys | Arg | Arg | Ala |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Ser | Gln | Lys | Glu | Arg | Glu | Lys | Pro | Leu | Pro | Thr | Phe | Lys | Asp | Leu | Asp |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Phe | Leu | Gln | Asp | Ile | Pro | Asp | Gly | Leu | Phe | Leu | Asp | Ala | Asp | Thr | Tyr |
|     |     |     | 275 |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Asn | Ala | Leu | Cys | Lys | Thr | Leu | Gln | Arg | Asp | Cys | Leu | Val | Leu | Gln | Ser |
|     |     |     | 290 |     |     |     | 295 |     |     |     |     | 300 |     |     |     |
| Phe | Lys | Ile | Met | Asp | Tyr | Ser | Leu | Trp | Leu | Ser | Ile | His | Asn | Ile | Asp |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |
| His | Ala | Gln | Arg | Glu | Pro | Leu | Ser | Ser | Asp | Thr | Leu | Gln | Val | Ser | Ile |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |
| Asp | Thr | Gln | Arg | Leu | Ala | Pro | Gln | Lys | Ala | Leu | Tyr | Ser | Thr | Ala | Met |
|     |     |     |     | 340 |     |     |     | 345 |     |     |     |     | 350 |     |     |
| Glu | Phe | Ile | Gln | Gly | Glu | Ala | Arg | Leu | Gly | Asp | Thr | Met | Glu | Ala | Asp |
|     |     |     | 355 |     |     |     | 360 |     |     |     |     | 365 |     |     |     |
| Asp | His | Met | Gly | Gly | Ile | Pro | Ala | Gln | Asn | Ser | Lys | Gly | Glu | Arg | Leu |
|     |     |     | 370 |     |     |     | 375 |     |     |     | 380 |     |     |     |     |
| Leu | Leu | Tyr | Ile | Gly | Ile | Ile | Asp | Ile | Leu | Gln | Ser | Tyr | Thr | Phe | Leu |
| 385 |     |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     | 400 |
| Lys | Lys | Leu | Glu | His | Ser | Trp | Lys | Ala | Val | Val | His | Asp | Gly | Asp | Ala |
|     |     |     |     | 405 |     |     |     |     | 410 |     |     |     |     | 415 |     |
| Val | Ser | Val | His | Arg | Pro | Gly | Phe | Tyr | Ala | Glu | Arg | Phe | Gln | His | Phe |

420                      425                      430  
 Met Cys Asn Ala Val Phe Lys Lys Ile Pro Leu Lys Pro Ser Pro Ser  
                     435                      440                      445  
 Lys Lys Phe Arg Ser Gly Leu Ser Phe Ser Leu His Thr Gly Ser Ser  
                     450                      455                      460  
 Gly Asn Ser Cys Ile Thr Tyr Gln Pro Leu Val Ser Glu Glu His Lys  
 465                      470                      475                      480  
 Ser Gln Val Ile Lys Val Gln Val Glu Pro Gly Val His Leu Gly Arg  
                     485                      490                      495  
 Ser Asp Val Leu Pro Gln Thr Ser Glu Ser Thr Phe Gly Gly Asn Gln  
                     500                      505                      510  
 Gly Gly Leu Thr Ile Thr Asp His Ser Phe Ser Pro Val Val Gly Lys  
                     515                      520                      525  
 Thr Leu His Met Leu Thr Thr Ser Ile Thr Leu Glu Lys Leu Glu Cys  
                     530                      535                      540  
 Thr Glu Ser Glu Phe Thr His  
 545                      550

<210> 77

<211> 1316

<212> DNA

<213> Homo sapiens

<400> 77

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ttaatttctt gagatattac aaaataaaat attacagtta ttgccttatt cacagtatac 180
aaaggatatt tatcatataa actgttgatc ctacagggac tggatcatgga ggagagtcta 240
tttttggcct aggattgtat ggtgatcaag caagcttttt tgagacagaa aacgtcccaa 300
gaattaagca caagaagaag ggcacaatgt ccatggtgaa taatgacagt gatcaacatg 360
gatctcagtt tcttatcact acaggagaaa atctagatta ccttgatggt acccatacag 420
tatttgggtga ggtgacagaa ggcattgaca taattaagaa aataaatgag acctttgttg 480
acaaggactt tgtaccatat caggatatca ggataaatta tatagtgatt ttagatggtc 540
catttgatga cattcctgat ttattaatcc ctgatcaatc accagaacct acaagggaac 600
aattaaagag tggtagagtt gacacaaatg aagaaattga tcatttcaaa cgaagggtcag 660
ccgaagaagt agaagaaata aaggcagaaa aagaagctaa aactcaggct ttacttttag 720
agatggtggg agacctacct gatgcagata ttaaacctcc ggaaaaatct gtgtttgtat 780
gcaaattgaa tccagtgacc acagatgagg atctggatat aatactctct agatttgggc 840
caataagaag ttgtgaagtt atctgggact ggaagacagg agaaatcctc tgttatttct 900
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<210> 78  
 <211> 432  
 <212> PRT  
 <213> Homo sapiens

<400> 78

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Val | Leu | Leu | Glu | Thr | Thr | Val | Gly | Asn | Val | Val | Val | Asn | Leu |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| His | Thr | Glu | Gln | Gln | Pro | Cys | Asn | Cys | Glu | Leu | Phe | Glu | Ser | Arg | Tyr |
|     |     | 20  |     |     |     |     | 25  |     |     |     |     |     | 30  |     |     |
| His | Ser | Leu | Met | Ala | Phe | Asn | Phe | Leu | Arg | Tyr | Tyr | Lys | Ile | Lys | Tyr |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Tyr | Ser | Tyr | Cys | Leu | Ile | His | Ser | Ile | Gln | Arg | Tyr | Phe | Ile | Ile | Gln |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Thr | Val | Asp | Pro | Thr | Gly | Thr | Gly | His | Gly | Gly | Glu | Ser | Ile | Phe | Gly |
|     | 65  |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Leu | Gly | Leu | Tyr | Gly | Asp | Gln | Ala | Ser | Phe | Phe | Glu | Thr | Glu | Asn | Val |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Pro | Arg | Ile | Lys | His | Lys | Lys | Lys | Gly | Thr | Met | Ser | Met | Val | Asn | Asn |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Asp | Ser | Asp | Gln | His | Gly | Ser | Gln | Phe | Leu | Ile | Thr | Thr | Gly | Glu | Asn |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Leu | Asp | Tyr | Leu | Asp | Gly | Thr | His | Thr | Val | Phe | Gly | Glu | Val | Thr | Glu |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Gly | Ile | Asp | Ile | Ile | Lys | Lys | Ile | Asn | Glu | Thr | Phe | Val | Asp | Lys | Asp |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Phe | Val | Pro | Tyr | Gln | Asp | Ile | Arg | Ile | Asn | Tyr | Ile | Val | Ile | Leu | Asp |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Gly | Pro | Phe | Asp | Asp | Ile | Pro | Asp | Leu | Leu | Ile | Pro | Asp | Gln | Ser | Pro |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Glu | Pro | Thr | Arg | Glu | Gln | Leu | Lys | Ser | Gly | Arg | Val | Asp | Thr | Asn | Glu |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Glu | Ile | Asp | His | Phe | Lys | Arg | Arg | Ser | Ala | Glu | Glu | Val | Glu | Glu | Ile |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Lys | Ala | Glu | Lys | Glu | Ala | Lys | Thr | Gln | Ala | Leu | Leu | Leu | Glu | Met | Val |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Gly | Asp | Leu | Pro | Asp | Ala | Asp | Ile | Lys | Pro | Pro | Glu | Lys | Ser | Val | Phe |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Val | Cys | Lys | Leu | Asn | Pro | Val | Thr | Thr | Asp | Glu | Asp | Leu | Asp | Ile | Ile |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |

Leu Ser Arg Phe Gly Pro Ile Arg Ser Cys Glu Val Ile Trp Asp Trp  
 275 280 285  
 Lys Thr Gly Glu Ile Leu Cys Tyr Phe Phe Leu Ser Phe Tyr Ala Phe  
 290 295 300  
 Ile Glu Phe Glu Lys Glu Glu Asp Tyr Glu Lys Ala Phe Phe Lys Met  
 305 310 315 320  
 Asp Asn Ile Leu Ile Asp Asp Arg Arg Lys His Gly Phe Ala Ser Leu  
 325 330 335  
 Leu Gln Arg Leu Asn Gly Arg Lys Lys Trp Glu Ile His Gln Gln Pro  
 340 345 350  
 Gly Arg Ser Pro Arg Arg Arg Arg Arg Pro His Arg Ser Arg Ser Arg  
 355 360 365  
 Arg Arg Arg Arg Arg Ala Gly Thr Pro Arg Arg Cys Ala Ser Ser Ser  
 370 375 380  
 Ala Thr Gly Asp Glu Gly Ser Glu Arg Asn Trp Arg Arg Arg Arg Arg  
 385 390 395 400  
 Arg Gln Trp Thr Trp Trp Leu Cys Gly Pro Trp Thr Pro Pro Ala Asp  
 405 410 415  
 Thr Glu Ala Arg Gly Gly Arg Arg Ala Ser Val Trp Glu Pro Ala Arg  
 420 425 430

<210> 79  
 <211> 1647  
 <212> DNA  
 <213> Homo sapiens

<400> 79  
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 ctcgccaccc atcacagcct ggagcactgg catcatctgt actatgggcc cagcttctcc 180  
 attgctagag atgctgaaga aaacgattaa gtctggaatt aatgtggctc atctgaactc 240  
 tcatggagcc catgagtacc atacagagac catcaagaac gtgcgcacag ccacggaaag 300  
 ctttgcttct gactccatcc tctaccagcc cattgctgtg gctccagaca ctaaaggacc 360  
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 agccactctc aagttcacgc tggataatac ctacatggaa aagggtaaag agaacatcct 480  
 gtggcggggac tacaagaaca tctgcaaggt ggtggaagtg ggctgcaaga tctacgtgga 540  
 tgatgggcta atttctctcc aagtgaagca gaaggatgct cactttctgg tgacagaggt 600  
 ggaaaatggg ggctccttgg gcagcaagaa gagtgtgaac cttcctgggg ctgccgtgga 660  
 cctgtctgcc atgttgagaa aggacatcca ggacctgaag tttggggggc agcaagatgt 720  
 cgatatgatg ttttcatcat tcatctgcaa gacatctgat gtccatgaag ttaggaaggt 780  
 cttgggagag aaaggaaaga acagcaagat aaccagcaaa attgagaatc atgatggggg 840  
 ttggagggtt gatgaaatcc tggaggccag cgatgggatt atggtagctc gtggtgatcc 900  
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tgtgatcaag aagctccacc ccacttgggc tgagggcagc ggtgtggcca atgcagttct 1080  
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<210> 80  
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 <212> PRT  
 <213> Homo sapiens

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 Leu Asp Thr Asp Ser Pro Pro Ile Thr Ala Trp Ser Thr Gly Ile Ile  
 35 40 45  
 Cys Thr Met Gly Pro Ala Ser Pro Leu Leu Glu Met Leu Lys Lys Thr  
 50 55 60  
 Ile Lys Ser Gly Ile Asn Val Ala His Leu Asn Ser His Gly Ala His  
 65 70 75 80  
 Glu Tyr His Thr Glu Thr Ile Lys Asn Val Arg Thr Ala Thr Glu Ser  
 85 90 95  
 Phe Ala Ser Asp Ser Ile Leu Tyr Gln Pro Ile Ala Val Ala Pro Asp  
 100 105 110  
 Thr Lys Gly Pro Glu Ile Pro Thr Gly Pro Val Lys Gly Ser Gly Thr  
 115 120 125  
 Ala Glu Val Glu Leu Lys Lys Gly Ala Thr Leu Lys Phe Thr Leu Asp  
 130 135 140  
 Asn Thr Tyr Met Glu Lys Gly Lys Glu Asn Ile Leu Trp Arg Asp Tyr  
 145 150 155 160  
 Lys Asn Ile Cys Lys Val Val Glu Val Gly Cys Lys Ile Tyr Val Asp  
 165 170 175  
 Asp Gly Leu Ile Ser Leu Gln Val Lys Gln Lys Asp Ala His Phe Leu  
 180 185 190  
 Val Thr Glu Val Glu Asn Gly Gly Ser Leu Gly Ser Lys Lys Ser Val  
 195 200 205



Asn Leu Pro Gly Ala Ala Val Asp Leu Ser Ala Met Leu Glu Lys Asp  
 210 215 220  
 Ile Gln Asp Leu Lys Phe Gly Gly Glu Gln Asp Val Asp Met Met Phe  
 225 230 235 240  
 Ser Ser Phe Ile Cys Lys Thr Ser Asp Val His Glu Val Arg Lys Val  
 245 250 255  
 Leu Gly Glu Lys Gly Lys Asn Ser Lys Ile Thr Ser Lys Ile Glu Asn  
 260 265 270  
 His Asp Gly Gly Trp Arg Phe Asp Glu Ile Leu Glu Ala Ser Asp Gly  
 275 280 285  
 Ile Met Val Ala Arg Gly Asp Pro Pro Gln Ala Val Glu Met Glu Ile  
 290 295 300  
 Pro Ala Gly Lys Val Cys Leu Ala Gln Arg Met Met Ile Gly Trp Cys  
 305 310 315 320  
 Asn Gln Ala Gly Lys Pro Val Ile Phe Ala Thr Gln Met Leu Glu Asp  
 325 330 335  
 Val Ile Lys Lys Leu His Pro Thr Trp Ala Glu Gly Ser Gly Val Ala  
 340 345 350  
 Asn Ala Val Leu Val Glu Ala Asp Cys Ile Met Leu Ser Gly Glu Thr  
 355 360 365  
 Ala Lys Gly Asn Tyr Pro Leu Glu Ala Val His Met Gln His Leu Ile  
 370 375 380  
 Ala Cys Glu Ala Glu Ala Thr Ile Tyr His Leu Glu Leu Phe Glu Glu  
 385 390 395 400  
 Phe Cys His Leu Ala Pro Ile Thr Ser Asp Pro Ala Glu Ala Thr Ala  
 405 410 415  
 Met Gly Thr Val Glu Ala Ser Phe Lys Cys Cys Ser Gly Ala Ile Ile  
 420 425 430  
 Val Leu Thr Lys Ser Ala Arg Cys Ala His Gln Val Ala Arg Tyr Cys  
 435 440 445  
 Pro Arg Ala Pro Met Ile Val Val Thr Trp His Pro Gln Ala Ala Arg  
 450 455 460  
 Gln Ala His Leu Tyr Arg Gly Ile Phe Pro Val Leu Cys Lys Asp Pro  
 465 470 475 480  
 Ile Gln Glu Pro Gln Ala Glu Asp Val Asp Leu Arg Val Asn Leu Ala  
 485 490 495  
 Met Asn Val Gly Lys Ala Arg Gly Phe Phe Lys Lys Asp Asp Val Val  
 500 505 510

Ile Val Leu Thr Trp Gly His Pro Gly Pro Gly Phe Ser Thr Thr Leu  
515 520 525

Cys Val Ile Pro Val Leu  
530

<210> 81  
<211> 600  
<212> DNA  
<213> Homo sapiens

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gaaaactttc gtgctctgag cactggagag aaaggatttg gttataaggg ttcctgcttt 180  
cacagaatta ttctagggct tttgtgtcag ggtgggtgact ttacatgcca taatggcact 240  
ggtggcaagt ctgtctacag ggagaaattt gatgatgaga acttcattct gaagcataca 300  
ggtcctggca tcttgtccat gaagcataca ggtcctggca tcttgtccat ggcaaatgct 360  
ggaccaaca caaacgattc ccagattttc atctgcactg ccaagaccga gtggttgat 420  
ggcaagcatg tggctctctg cagggtgaaa gaaggcatca agattgtgga ggccatgaag 480  
cgctatgggt ccaagaatgg caagagcagg aagaagatca ccactgctga ctgtggacaa 540  
ctctaataag tttgacttgt gttttatctt aaccaccaga ccattccttt tgtagctcag 600

<210> 82  
<211> 173  
<212> PRT  
<213> Homo sapiens

<400> 82  
Met Val Asn Pro Thr Met Phe Phe Asn Ile Ala Ile Asn Ser Glu Ala  
1 5 10 15  
Leu Gly His Val Ser Phe Glu Leu Phe Ala Asp Lys Phe Pro Lys Thr  
20 25 30  
Glu Asn Phe Arg Ala Leu Ser Thr Gly Glu Lys Gly Phe Gly Tyr Lys  
35 40 45  
Gly Ser Cys Phe His Arg Ile Ile Leu Gly Leu Leu Cys Gln Gly Gly  
50 55 60  
Asp Phe Thr Cys His Asn Gly Thr Gly Gly Lys Ser Val Tyr Arg Glu  
65 70 75 80  
Lys Phe Asp Asp Glu Asn Phe Ile Leu Lys His Thr Gly Pro Gly Ile  
85 90 95  
Leu Ser Met Lys His Thr Gly Pro Gly Ile Leu Ser Met Ala Asn Ala  
100 105 110  
Gly Pro Asn Thr Asn Asp Ser Gln Ile Phe Ile Cys Thr Ala Lys Thr  
115 120 125  
Glu Trp Leu Asp Gly Lys His Val Val Ser Gly Arg Val Lys Glu Gly

130 135 140  
 Ile Lys Ile Val Glu Ala Met Lys Arg Tyr Gly Ser Lys Asn Gly Lys  
 145 150 155 160

Ser Arg Lys Lys Ile Thr Thr Ala Asp Cys Gly Gln Leu  
 165 170

<210> 83  
 <211> 566  
 <212> DNA  
 <213> Homo sapiens

<400> 83  
 gtactaccag ccatgggtcaa cccaccatg ttcttcaaca tcgccatcaa cagcgaggcc 60  
 ttggggcacg tctccttcga actgtttgca gacaagtttc caaagacaga aaactttcgt 120  
 gctctgagca ctggagagaa aggatttggg tataagggtt cctgctttca cagaattatt 180  
 ctagggtctt tgtgtcaggg tggtgacttt acatgccata atggcactgg tggcaagtct 240  
 gtctacaggg agaaatttga tgatgagaac ttcattctga agcatacagg tcctggcatc 300  
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 aacgattccc agattttcat ctgcactgcc aagaccgagt gggttgatgg caagcatgtg 420  
 gtctctggca ggggtgaaaga aggcataag attgtggagg ccatgaagcg ctatgggtcc 480  
 aagaatggca agagcaggaa gaagatcacc actgctgact gtggacaact ctaataagtt 540  
 tgacttgtgt tttatcttaa ccacca 566

<210> 84  
 <211> 173  
 <212> PRT  
 <213> Homo sapiens

<400> 84  
 Met Val Asn Pro Thr Met Phe Phe Asn Ile Ala Ile Asn Ser Glu Ala  
 1 5 10 15  
 Leu Gly His Val Ser Phe Glu Leu Phe Ala Asp Lys Phe Pro Lys Thr  
 20 25 30  
 Glu Asn Phe Arg Ala Leu Ser Thr Gly Glu Lys Gly Phe Gly Tyr Lys  
 35 40 45  
 Gly Ser Cys Phe His Arg Ile Ile Leu Gly Leu Leu Cys Gln Gly Gly  
 50 55 60  
 Asp Phe Thr Cys His Asn Gly Thr Gly Gly Lys Ser Val Tyr Arg Glu  
 65 70 75 80  
 Lys Phe Asp Asp Glu Asn Phe Ile Leu Lys His Thr Gly Pro Gly Ile  
 85 90 95  
 Leu Ser Met Lys His Thr Gly Pro Gly Ile Leu Ser Met Ala Asn Ala  
 100 105 110  
 Gly Pro Asn Thr Asn Asp Ser Gln Ile Phe Ile Cys Thr Ala Lys Thr  
 115 120 125

Glu Trp Leu Asp Gly Lys His Val Val Ser Gly Arg Val Lys Glu Gly  
 130 135 140

Ile Lys Ile Val Glu Ala Met Lys Arg Tyr Gly Ser Lys Asn Gly Lys  
 145 150 155 160

Ser Arg Lys Lys Ile Thr Thr Ala Asp Cys Gly Gln Leu  
 165 170

<210> 85  
 <211> 660  
 <212> DNA  
 <213> Homo sapiens

<400> 85  
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 ttccacattg ctgtcgatgg cgagcccttg ggctgtgtct ccttcgaggt agagctgttt 180  
 gcagacaagg ttccaaagac agcagaaaat ttccatgctc tgagcactgg agaaaaagga 240  
 tttggttata agggttcctg ctttcacaga attattccag gggtttacgtg tcagagtggg 300  
 gacttcacac gccatgggtg caagtccatc tgcagggaga aatttgatga caagaacttc 360  
 atcctgaagc atacgggtcc tggcatcttg tccatggcaa atgctggacc cagcgtgaac 420  
 gtttcccagt tttttatctg ccctgccaa acagagtggg tggattgcaa gcatgtgggc 480  
 tttggcaagg tgaaagatgg catgaatatt gtggagggtca tggagcactt ggggtccaag 540  
 aatggcaaga tcagcaagaa gatcaccatt gctgactgga caactgcaat aaatttgacg 600  
 ggtgttttctc ttaaaaaaaaa aaaaaaata ctgtgacaga ccaaggtaaa ttgtttttga 660

<210> 86  
 <211> 203  
 <212> PRT  
 <213> Homo sapiens

<400> 86  
 Met Lys Leu Thr Phe Lys Lys Lys Ala Val Ser Phe Ala Asp Ala Ala  
 1 5 10 15  
 Ala Ala Gln Gly Pro Leu Leu Pro Ala Met Val Asn Pro Thr Met Phe  
 20 25 30  
 Phe His Ile Ala Val Asp Gly Glu Pro Leu Gly Cys Val Ser Phe Glu  
 35 40 45  
 Val Glu Leu Phe Ala Asp Lys Val Pro Lys Thr Ala Glu Asn Phe His  
 50 55 60  
 Ala Leu Ser Thr Gly Glu Lys Gly Phe Gly Tyr Lys Gly Ser Cys Phe  
 65 70 75 80  
 His Arg Ile Ile Pro Gly Phe Thr Cys Gln Ser Gly Asp Phe Thr Arg  
 85 90 95  
 His Gly Gly Lys Ser Ile Cys Arg Glu Lys Phe Asp Asp Lys Asn Phe  
 100 105 110  
 Ile Leu Lys His Thr Gly Pro Gly Ile Leu Ser Met Ala Asn Ala Gly

115                                      120                                      125  
 Pro Ser Val Asn Val Ser Gln Phe Phe Ile Cys Pro Ala Lys Thr Glu  
     130                                      135                                      140  
 Trp Leu Asp Cys Lys His Val Val Phe Gly Lys Val Lys Asp Gly Met  
 145                                      150                                      155                                      160  
 Asn Ile Val Glu Val Met Glu His Leu Gly Ser Lys Asn Gly Lys Ile  
                                     165                                      170                                      175  
 Ser Lys Lys Ile Thr Ile Ala Asp Trp Thr Thr Ala Ile Asn Leu Thr  
                                     180                                      185                                      190  
 Gly Val Ser Leu Lys Lys Lys Lys Lys Ile Leu  
                                     195                                      200

<210> 87  
 <211> 600  
 <212> DNA  
 <213> Homo sapiens

<400> 87  
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 atgtcaccac tgccagtgat ggtcacctcc accttggttct ttaactttgt agtcaacggg 120  
 gagcacttgg gccatgtctc cttccagctg tttgcaaaga aagttccaaa gacagcagaa 180  
 aatgttcatt ttgtgagcac tggagagaaa ggatttggct ataagtgttc ctgttttcac 240  
 agaattattc cagggtttat atgccagagt ggtgacttca catgtcatga tgacactggc 300  
 acaaagtcca actactggga gaagtctgat gatgataact ccatacctgaa gcatacaaga 360  
 cctggcacct tgtccatggc aaatactgga cgctacacaa atgggtttcca gtttttcatc 420  
 tgcactgcca aaactgtgtg gttgggtggc aagagtgcag tctttggcaa gacaaaagag 480  
 ggcttgaata tcttgggaagc catggcgcac tttgctttct ggaatggcaa aaccagaaag 540  
 aagaccacga ttgacaactg tggacaactc caataaattt aacttatgtt ttgttttaac 600

<210> 88  
 <211> 176  
 <212> PRT  
 <213> Homo sapiens

<400> 88  
 Met Pro Leu Pro Leu Met Ser Pro Leu Pro Val Met Val Thr Ser Thr  
     1                                      5                                      10                                      15  
 Leu Phe Phe Asn Phe Val Val Asn Gly Glu His Leu Gly His Val Ser  
                                     20                                      25                                      30  
 Phe Gln Leu Phe Ala Lys Lys Val Pro Lys Thr Ala Glu Asn Val His  
                                     35                                      40                                      45  
 Phe Val Ser Thr Gly Glu Lys Gly Phe Gly Tyr Lys Cys Ser Cys Phe  
                                     50                                      55                                      60  
 His Arg Ile Ile Pro Gly Phe Ile Cys Gln Ser Gly Asp Phe Thr Cys  
     65                                      70                                      75                                      80

His Asp Asp Thr Gly Thr Lys Ser Asn Tyr Trp Glu Lys Ser Asp Asp  
                             85                            90                            95  
 Asp Asn Ser Ile Leu Lys His Thr Arg Pro Gly Thr Leu Ser Met Ala  
                             100                            105                            110  
 Asn Thr Gly Arg Tyr Thr Asn Gly Phe Gln Phe Phe Ile Cys Thr Ala  
                             115                            120                            125  
 Lys Thr Val Trp Leu Gly Gly Lys Ser Ala Val Phe Gly Lys Thr Lys  
                             130                            135                            140  
 Glu Gly Leu Asn Ile Leu Glu Ala Met Ala His Phe Ala Phe Trp Asn  
 145                            150                            155                            160  
 Gly Lys Thr Arg Lys Lys Thr Thr Ile Asp Asn Cys Gly Gln Leu Gln  
                             165                            170                            175

<210> 89  
 <211> 600  
 <212> DNA  
 <213> Homo sapiens

<400> 89  
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 atgatttcgt gtttttggac atttctatac tgtgatgtgt gtcccaaac atgtaaaaat 120  
 tttcaggctt tgtgcacagg aaaagcaggg ttttctcaac gtggcataag actacattac 180  
 aaaaattcca tttttcatcg aatagtacag aatggctgga tacaaggagg ggatatagtg 240  
 tatggaaaag gagataatgg agagtcgatt tatggtccaa catttgaaga tgaaaacttt 300  
 tcagttcctc ataataaaaag aggagtactt ggaatggcca acaaaggccg tcacagcaac 360  
 gggtcacaaat tctatatcac actgcaagca actccttatc tagatagaaa atttgtggct 420  
 tttgggtatg tatattgtag atctatttat ataatttca cacctggtag taaaaaagcc 480  
 cagagaagta tgtgcaagaa actaacagta tgtggttggt ggcgtagttt ttcaaaggaa 540  
 gaagtagtca aatgctgtaa caaggacaac tcactcttgaa acacttacgc agtgggtgtgt 600

<210> 90  
 <211> 180  
 <212> PRT  
 <213> Homo sapiens

<400> 90  
 Met Ile Leu Leu Asn Leu His Ser Met Ile Ser Cys Phe Trp Thr Phe  
   1                            5                            10                            15  
 Leu Tyr Cys Asp Val Cys Pro Lys Thr Cys Lys Asn Phe Gln Val Leu  
                             20                            25                            30  
 Cys Thr Gly Lys Ala Gly Phe Ser Gln Arg Gly Ile Arg Leu His Tyr  
                             35                            40                            45  
 Lys Asn Ser Ile Phe His Arg Ile Val Gln Asn Gly Trp Ile Gln Gly  
   50                            55                            60

Gly Asp Ile Val Tyr Gly Lys Gly Asp Asn Gly Glu Ser Ile Tyr Gly  
 65 70 75 80  
 Pro Thr Phe Glu Asp Glu Asn Phe Ser Val Pro His Asn Lys Arg Gly  
 85 90 95  
 Val Leu Gly Met Ala Asn Lys Gly Arg His Ser Asn Gly Ser Gln Phe  
 100 105 110  
 Tyr Ile Thr Leu Gln Ala Thr Pro Tyr Leu Asp Arg Lys Phe Val Ala  
 115 120 125  
 Phe Gly Tyr Val Tyr Cys Arg Ser Ile Tyr Ile Ile Phe Thr Pro Gly  
 130 135 140  
 Ser Lys Lys Ala Gln Arg Ser Met Cys Lys Lys Leu Thr Val Cys Gly  
 145 150 155 160  
 Cys Gly Arg Ser Phe Ser Lys Glu Glu Val Val Lys Cys Cys Asn Lys  
 165 170 175  
 Asp Asn Ser Ser  
 180

<210> 91  
 <211> 572  
 <212> DNA  
 <213> Homo sapiens

<400> 91  
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 tgttcttttg acatcattgt tgatggtaac tcctttggcc catgcagctc cttcgagctg 120  
 tttgccgaca aagttccaaa aacagtggaa aactttcgtg cactgagcac tggaggaaaa 180  
 ggatttggtt ataagggttc ctgctttcac agaattattc cagggtttat tttatctgcc 240  
 agagtgtgta cttcacacac cataataatg cccagtgcca tctaccagga gaaatttgat 300  
 gatgagaact tcattcttgaa gcacacaggt cctggcatct tgtccatggc aaatgctggc 360  
 ccggacacaa atggttccca gtttttcacc tgtgtggcca agactgagtg gctggatggc 420  
 aagcacaagg tctttggcaa agtgagaaga ggggtgaata tcatggaagc catggagtgc 480  
 tctgggtccg ggaatgggtga gactggcaag aagatcacca ctgccaaactg cggacaactc 540  
 taatcaatct gcttgtgttt gatcttaacc ac 572

<210> 92  
 <211> 166  
 <212> PRT  
 <213> Homo sapiens

<400> 92  
 Met Val Asn Ala Pro Leu Cys Ser Phe Asp Ile Ile Val Asp Gly Asn  
 1 5 10 15  
 Ser Phe Gly Pro Cys Ser Ser Phe Glu Leu Phe Ala Asp Lys Val Pro  
 20 25 30  
 Lys Thr Val Glu Asn Phe Arg Ala Leu Ser Thr Gly Gly Lys Gly Phe

35                      40                      45  
 Gly Tyr Lys Gly Ser Cys Phe His Arg Ile Ile Pro Gly Phe Ile Leu  
     50                      55                      60  
 Ser Ala Arg Val Leu Thr Ser His Thr Ile Ile Met Pro Gln Ser Ile  
     65                      70                      75                      80  
 Tyr Gln Glu Lys Phe Asp Asp Glu Asn Phe Ile Leu Lys His Thr Gly  
                     85                      90                      95  
 Pro Gly Ile Leu Ser Met Ala Asn Ala Gly Pro Asp Thr Asn Gly Ser  
                     100                      105                      110  
 Gln Phe Phe Thr Cys Val Ala Lys Thr Glu Trp Leu Asp Gly Lys His  
                     115                      120                      125  
 Lys Val Phe Gly Lys Val Arg Arg Gly Val Asn Ile Met Glu Ala Met  
                     130                      135                      140  
 Glu Cys Ser Gly Ser Gly Asn Gly Glu Thr Gly Lys Lys Ile Thr Thr  
     145                      150                      155                      160  
 Ala Asn Cys Gly Gln Leu  
                     165

<210> 93  
 <211> 525  
 <212> DNA  
 <213> Homo sapiens

<400> 93  
 gccagaact cctgccacc agccatggcc aacccactg tgttcttcaa cattgcaatt 60  
 gatagtgagt ccttgggctg catctccttc aagctatttg cagacaaagt tctaaagatg 120  
 gaagaaaatt tttgtgctct gaacactgga gagaaagtat ttggtgataa atgtccctgc 180  
 ttttacagaa ttattccggg ggtgtgtcag ggtggtgact tcacacacca taatggcact 240  
 ggtggcaagt cctctacag caaggaattt gatgatgaga acttcctcct aaagcataca 300  
 gtcctggcg tcttgtccac ggcaaagct ggacccacca caaatgggtc ccagtttttc 360  
 ttctgtactg ccaagacaga ggatggacag catgtggtct ttggcaaggt gaaagatggc 420  
 atgagtattg tggaagccct ggaacgctct gggtccagga atggtaagac cagcaagaag 480  
 atcacagctg ctgactgtgg acaactctaa taaatttgat tgttt 525

<210> 94  
 <211> 161  
 <212> PRT  
 <213> Homo sapiens

<400> 94  
 Met Ala Asn Pro Thr Val Phe Phe Asn Ile Ala Ile Asp Ser Glu Ser  
     1                      5                      10                      15  
 Leu Gly Cys Ile Ser Phe Lys Leu Phe Ala Asp Lys Val Leu Lys Met  
                     20                      25                      30  
 Glu Glu Asn Phe Cys Ala Leu Asn Thr Gly Glu Lys Val Phe Gly Asp



|   |     |     |
|---|-----|-----|
| 35  | 40  | 45  |
| Lys Cys Pro Cys Phe Tyr Arg Ile Ile Pro Gly Val Cys Gln Gly Gly |     |     |
| 50  | 55  | 60  |
| Asp Phe Thr His His Asn Gly Thr Gly Gly Lys Ser Leu Tyr Ser Lys |     |     |
| 65  | 70  | 75  |
| Glu Phe Asp Asp Glu Asn Phe Ile Leu Lys His Thr Ala Pro Gly Val |     |     |
|   | 85  | 90  |
| Leu Ser Thr Ala Asn Ala Gly Pro Thr Thr Asn Gly Ser Gln Phe Phe |     |     |
|   | 100 | 105 |
| Phe Cys Thr Ala Lys Thr Glu Asp Gly Gln His Val Val Phe Gly Lys |     |     |
|   | 115 | 120 |
| Val Lys Asp Gly Met Ser Ile Val Glu Ala Leu Glu Arg Ser Gly Ser |     |     |
|   | 130 | 135 |
| Arg Asn Gly Lys Thr Ser Lys Lys Ile Thr Ala Ala Asp Cys Gly Gln |     |     |
| 145   | 150 | 155 |

Leu

<210> 95

<211> 720

<212> DNA

<213> Homo sapiens

<400> 95

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catcaggaaa atgcaaatca aaccacaacg agatatcatg tcacaccaat taggatggcc 60
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cactgttggg gggaatataa aatgatgcag ctggcctttgc agacactgct gtcccccaac 180
accccctgtc actaggccat ggtcatcccg actgtgccct tcaacatcac catcaacagc 240
aagcccttag gacacatctc ctttcagcta tttgcagaca aatttccaaa gacaggagaa 300
aactttcaca ctctgaacaa taaagacaaa ggattttggtt cctgctttca cagaattatt 360
ccggagttaa tatgccaggg tgatgacttc acaccccata atggcattgg tggcaagtcc 420
atctacgggg ataaatttga tgataagaac tttattgtga agcatacagg tcttggcatc 480
ttgtccatgg caaatgctgc acccaaaaca aatgagtccc agtttttcat ctgcactgcc 540
atggccaaat ggtgggatgg caagcatgtg atctttggca gggtgaaaga gggcatgaat 600
attgtggaag ccatggaatg ctttgggtcc aggaatggca agacaagcaa gatcgccatt 660
gccaaactgca gacaactctg ataaatttga cttgtgtttt atcttaacca ccagaccttt 720

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<210> 96

<211> 160

<212> PRT

<213> Homo sapiens

<400> 96

|   |
|---|
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| 1 5 10 15   |

Leu Gly His Ile Ser Phe Gln Leu Phe Ala Asp Lys Phe Pro Lys Thr

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     | 20  |     | 25  |     | 30  |     |     |     |     |     |     |     |     |     |     |
| Gly | Glu | Asn | Phe | His | Thr | Leu | Asn | Asn | Lys | Asp | Lys | Gly | Phe | Gly | Ser |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Cys | Phe | His | Arg | Ile | Ile | Pro | Glu | Phe | Ile | Cys | Gln | Gly | Asp | Asp | Phe |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Thr | Pro | His | Asn | Gly | Ile | Gly | Gly | Lys | Ser | Ile | Tyr | Gly | Asp | Lys | Phe |
|     | 65  |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Asp | Asp | Lys | Asn | Phe | Ile | Val | Lys | His | Thr | Gly | Leu | Gly | Ile | Leu | Ser |
|     |     |     | 85  |     |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Met | Ala | Asn | Ala | Ala | Pro | Lys | Thr | Asn | Glu | Ser | Gln | Phe | Phe | Ile | Cys |
|     |     | 100 |     |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Thr | Ala | Met | Ala | Lys | Trp | Trp | Asp | Gly | Lys | His | Val | Ile | Phe | Gly | Arg |
|     | 115 |     |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Val | Lys | Glu | Gly | Met | Asn | Ile | Val | Glu | Ala | Met | Glu | Cys | Phe | Gly | Ser |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Arg | Asn | Gly | Lys | Thr | Ser | Lys | Ile | Ala | Ile | Ala | Asn | Cys | Arg | Gln | Leu |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |

<210> 97  
 <211> 600  
 <212> DNA  
 <213> Homo sapiens

<400> 97  
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 acagcaagcc cttaggacac atctcctttc agctatttgc agacaaattt ccaaagacag 180  
 gagaaaactt tcacactctg aacaataaag acaaaggatt tggttcctgc tttcacagaa 240  
 ttattccgga gtttatatgc cagggtgatg acttcacacc ccataatggc attggtggca 300  
 agtccatcta cggggataaa ttgatgata agaactttat tgtgaagcat acaggtcttg 360  
 gcatcttgtc catggcaaat gctgcacca aaacaaatga gtcccagttt ttcactctgca 420  
 ctgccatggc caaatggtgg gatggcaagc atgtgatctt tggcagggtg aaagagggca 480  
 tgaatattgt ggaagccatg gaatgctttg ggtccaggaa tggcaagaca agcaagatcg 540  
 ccattgccaa ctgcagacaa ctctgataaa tttgacttgt gttttatctt aaccaccaga 600

<210> 98  
 <211> 160  
 <212> PRT  
 <213> Homo sapiens

<400> 98  
 Met Val Ile Pro Thr Val Pro Phe Asn Ile Thr Ile Asn Ser Lys Pro  
 1 5 10 15

Leu Gly His Ile Ser Phe Gln Leu Phe Ala Asp Lys Phe Pro Lys Thr  
                   20                                  25                                  30  
 Gly Glu Asn Phe His Thr Leu Asn Asn Lys Asp Lys Gly Phe Gly Ser  
                   35                                  40                                  45  
 Cys Phe His Arg Ile Ile Pro Glu Phe Ile Cys Gln Gly Asp Asp Phe  
                   50                                  55                                  60  
 Thr Pro His Asn Gly Ile Gly Gly Lys Ser Ile Tyr Gly Asp Lys Phe  
                   65                                  70                                  75                                  80  
 Asp Asp Lys Asn Phe Ile Val Lys His Thr Gly Leu Gly Ile Leu Ser  
                                   85                                  90                                  95  
 Met Ala Asn Ala Ala Pro Lys Thr Asn Glu Ser Gln Phe Phe Ile Cys  
                                   100                                  105                                  110  
 Thr Ala Met Ala Lys Trp Trp Asp Gly Lys His Val Ile Phe Gly Arg  
                   115                                  120                                  125  
 Val Lys Glu Gly Met Asn Ile Val Glu Ala Met Glu Cys Phe Gly Ser  
                   130                                  135                                  140  
 Arg Asn Gly Lys Thr Ser Lys Ile Ala Ile Ala Asn Cys Arg Gln Leu  
                   145                                  150                                  155                                  160

<210> 99

<211> 3146

<212> DNA

<213> Homo sapiens

<400> 99

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 gctgatgaaa acttttctcat gattgacact tgcaggacac atatgccatt atttctacaa 180  
 ggagggtcaag cgaggaagag ctttggtttt aaaaaggcct tgtattttca atatactgat 240  
 aatacatttc aaaggatcat tgaaaaacca tcctgggttg gatttttagg tccaatgatt 300  
 aaagcagaga ctggagactt catttatgta catgtaaaaa ataatgcttc aagagcttat 360  
 agttatcatc ctcatgggct cacctactcc aaagaaaatg aagggtgctat ctatcctgat 420  
 aatacgacag gcctgcaaaa ggaagatgaa tatctggagc cagggaaca atatacctac 480  
 aagtggatg tagaagaaca tcaggacact ggccccaatg acagtaattg tgtgacaaga 540  
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 ctgacttgta aaagaggtac actgaatgga gacactgaaa aagatattga cagggtcttct 660  
 tttctgatgt tttctacaac tgatgaaagc agaagctggt atagtgatga aaatattcgt 720  
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 Arg Thr His Met Pro Leu Phe Leu Gln Gly Gly Gln Ala Arg Lys Ser  
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 Phe Val Phe Lys Lys Ala Leu Tyr Phe Gln Tyr Thr Asp Asn Thr Phe  
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|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
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|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Glu | Asn | Glu | Gly | Ala | Ile | Tyr | Pro | Asp | Asn | Thr | Thr | Gly | Leu | Gln | Lys |
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| Glu | Asp | Glu | Tyr | Leu | Glu | Pro | Gly | Lys | Gln | Tyr | Thr | Tyr | Lys | Trp | Tyr |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Val | Glu | Glu | His | Gln | Gly | Pro | Gly | Pro | Asn | Asp | Ser | Asn | Cys | Val | Thr |
|     |     |     | 165 |     |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Arg | Ile | Tyr | His | Ser | His | Ile | Asp | Thr | Ala | Arg | Asp | Val | Ala | Ser | Gly |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Leu | Ile | Gly | Pro | Ile | Leu | Thr | Cys | Lys | Arg | Gly | Thr | Leu | Asn | Gly | Asp |
|     | 195 |     |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Thr | Glu | Lys | Asp | Ile | Asp | Arg | Ser | Ser | Phe | Leu | Met | Phe | Ser | Thr | Thr |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Asp | Glu | Ser | Arg | Ser | Trp | Tyr | Ser | Asp | Glu | Asn | Ile | Arg | Ala | Phe | Thr |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Glu | Ser | Gly | Lys | Ile | Asn | Thr | Ser | Asp | Pro | Arg | Phe | Glu | Glu | Ser | Met |
|     |     |     | 245 |     |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Ser | Met | Gln | Ala | Ile | Asn | Gly | Tyr | Ile | Tyr | Gly | Asn | Leu | Pro | Asn | Leu |
|     |     | 260 |     |     |     |     | 265 |     |     |     |     |     | 270 |     |     |
| Thr | Met | Cys | Ala | Glu | Asp | Arg | Val | Gln | Trp | Tyr | Phe | Val | Gly | Met | Gly |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Gly | Val | Ala | Asp | Ile | His | Pro | Val | Tyr | Leu | Arg | Gly | Gln | Thr | Leu | Ile |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |
| Ser | Arg | Asn | His | Arg | Lys | Asp | Thr | Ile | Met | Leu | Phe | Pro | Ser | Ser | Leu |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |
| Glu | Asp | Ala | Phe | Met | Val | Ala | Lys | Ala | Pro | Gly | Val | Trp | Met | Leu | Gly |
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| Cys | Gln | Met | Gln | Ala | Phe | Phe | Lys | Val | Ser | Asn | Cys | Gln | Lys | Pro | Ser |
|     |     | 340 |     |     |     |     |     | 345 |     |     |     |     | 350 |     |     |
| Thr | Glu | Ala | Phe | Val | Thr | Gly | Thr | His | Val | Ile | His | Tyr | Tyr | Ile | Ala |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |
| Ala | Lys | Glu | Ile | Leu | Trp | Asn | Tyr | Ala | Pro | Ser | Gly | Ile | Asp | Phe | Phe |
|     | 370 |     |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |
| Thr | Lys | Lys | Asn | Leu | Thr | Ala | Ala | Gly | Ser | Lys | Ser | Gln | Leu | Phe | Phe |

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| Glu Arg Ser Pro Thr Arg Ile Gly Gly Thr Asn Lys Lys Leu Ile Tyr |  |     |  |     |  |     |
|   |  | 405 |  | 410 |  | 415 |
| Arg Glu Tyr Thr Asp Ala Ser Phe Gln Thr Gln Lys Ala Arg Glu Glu |  |     |  |     |  |     |
|   |  | 420 |  | 425 |  | 430 |
| His Leu Gly Ile Leu Gly Pro Val Ile Lys Ala Glu Val Arg Gln Thr |  |     |  |     |  |     |
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| Ile Lys Ile Thr Phe Tyr Asn Asn Ala Ser Leu Pro Leu Ser Ile Gln |  |     |  |     |  |     |
|   |  | 450 |  | 455 |  | 460 |
| Pro Pro Gly Leu His Tyr Asn Lys Ser Leu Trp Gln Ser Tyr Tyr Phe |  |     |  |     |  |     |
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| Ser Ser Tyr Ser Thr Val Thr Gln Arg Glu Arg Ser Val Pro Pro Pro |  |     |  |     |  |     |
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| Ser Ser His Val Ser Pro Gly Thr Thr Phe Val Tyr Thr Trp Glu Val |  |     |  |     |  |     |
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| Pro Lys Asp Val Gly Pro Thr Ser Thr Asp Pro Asn Cys Leu Thr Trp |  |     |  |     |  |     |
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| Phe Tyr Tyr Ser Ser Val Asn Gly Lys Lys Asp Ile Asn Ser Gly Leu |  |     |  |     |  |     |
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| Leu Gly Pro Leu Leu Ile Cys Arg Asn Gly Ser Leu Gly Asp Asp Gly |  |     |  |     |  |     |
|   |  | 545 |  | 550 |  | 555 |
| Lys Gln Lys Gly Val Asp Lys Glu Phe Tyr Leu Leu Ala Thr Ile Phe |  |     |  |     |  |     |
|   |  | 565 |  | 570 |  | 575 |
| Asp Glu Asn Glu Ser Asn Leu Leu Asp Glu Asn Ile Arg Thr Phe Ile |  |     |  |     |  |     |
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| Thr Glu Pro Glu Asn Ile Asp Lys Glu Asp Thr Asp Cys Gln Ala Ser |  |     |  |     |  |     |
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| Asn Lys Met Tyr Ala Ile Asn Gly Tyr Met Tyr Gly Asn Leu Pro Gly |  |     |  |     |  |     |
|   |  | 610 |  | 615 |  | 620 |
| Leu Asp Thr Cys Leu Gly Asp Asn Val Leu Trp His Val Phe Ser Val |  |     |  |     |  |     |
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| Gly Ser Val Glu Asp Leu His Gly Ile Tyr Phe Ser Gly Asn Thr Phe |  |     |  |     |  |     |
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| Thr Ser Leu Gly Ala Arg Arg Asp Thr Ile Pro Met Phe Pro Tyr Thr |  |     |  |     |  |     |
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| Ser Gln Thr Leu Leu Met Thr Pro Asp Ser Ile Gly Thr Phe Asp Leu |  |     |  |     |  |     |
|   |  | 675 |  | 680 |  | 685 |
| Val Cys Met Thr Ile Lys His Asn Leu Gly Gly Met Lys His Lys Tyr |  |     |  |     |  |     |

| 690 |     |     |     |     | 695 |     |     |     |     | 700 |     |     |     |     |     |
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| His | Val | Arg | Gln | Cys | Gly | Lys | Pro | Asn | Pro | Asp | Gln | Thr | Gln | Tyr | Gln |
| 705 |     |     |     |     | 710 |     |     |     |     | 715 |     |     |     |     | 720 |
| Glu | Glu | Lys | Ile | Ile | Ile | Thr | Ile | Ala | Ala | Glu | Glu | Met | Glu | Trp | Asp |
|     |     |     |     |     | 725 |     |     |     |     | 730 |     |     |     |     | 735 |
| Tyr | Ser | Pro | Ser | Arg | Lys | Trp | Glu | Asn | Glu | Leu | His | His | Leu | Arg | Arg |
|     |     |     |     |     | 740 |     |     |     |     | 745 |     |     |     | 750 |     |
| Glu | Ser | Gln | Thr | Ser | Met | Tyr | Val | Asp | Arg | Ser | Gly | Thr | Leu | Leu | Gly |
|     |     |     |     |     | 755 |     |     |     |     |     |     |     |     | 765 |     |
| Ser | Lys | Tyr | Lys | Lys | Val | Leu | Tyr | Arg | Gln | Tyr | Asp | Asp | Asn | Thr | Ser |
|     |     |     |     |     | 770 |     |     |     |     |     |     |     |     | 780 |     |
| Gln | Ile | Lys | Gln | Lys | Gly | Met | Arg | Val | Lys | Asn | Ile | Ser | Ile | Leu | Gly |
|     |     |     |     |     | 790 |     |     |     |     |     |     |     |     | 800 |     |
| Pro | Leu | Ile | Leu | Leu | Asn | Pro | Gly | Gln | Ile | Ile | Gln | Ile | Ile | Phe | Lys |
|     |     |     |     |     | 805 |     |     |     |     | 810 |     |     |     | 815 |     |
| Asn | Lys | Ala | Ala | Arg | Pro | Tyr | Ser | Ile | His | Ala | His | Gly | Val | Lys | Thr |
|     |     |     |     |     | 820 |     |     |     |     | 825 |     |     |     | 830 |     |
| Asn | Asn | Ser | Thr | Val | Val | Pro | Thr | Gln | Pro | Gly | Glu | Ile | Gln | Ile | Tyr |
|     |     |     |     |     | 835 |     |     |     |     | 840 |     |     |     | 845 |     |
| Thr | Trp | Gln | Ile | Pro | Asp | Arg | Thr | Gly | Pro | Thr | Ser | Leu | Asp | Phe | Glu |
|     |     |     |     |     | 850 |     |     |     |     | 855 |     |     |     | 860 |     |
| Cys | Ile | Pro | Trp | Phe | Tyr | Tyr | Ser | Thr | Val | Ser | Val | Ala | Lys | Asp | Leu |
|     |     |     |     |     | 865 |     |     |     |     | 870 |     |     |     | 875 | 880 |
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|     |     |     |     |     | 885 |     |     |     |     | 890 |     |     |     | 895 |     |
| Pro | Asn | Ile | Val | His | Arg | Val | Leu | His | Phe | Met | Ile | Phe | Asp | Glu | Asn |
|     |     |     |     |     | 900 |     |     |     |     | 905 |     |     |     | 910 |     |
| Glu | Ser | Trp | Tyr | Phe | Glu | Asp | Ser | Ile | Asn | Thr | Tyr | Ala | Ser | Lys | Pro |
|     |     |     |     |     | 915 |     |     |     |     | 920 |     |     | 925 |     |     |
| Asn | Lys | Val | Asp | Lys | Glu | Asn | Asp | Asn | Phe | Gln | Leu | Ser | Asn | Gln | Met |
|     |     |     |     |     | 930 |     |     |     |     | 935 |     |     | 940 |     |     |
| His | Ala | Ile | Asn | Gly | Arg | Leu | Phe | Gly | Asn | Asn | Gln | Gly | Ile | Thr | Phe |
|     |     |     |     |     | 945 |     |     |     |     | 950 |     |     | 955 |     | 960 |
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|     |     |     |     |     | 965 |     |     |     |     | 970 |     |     |     | 975 |     |
| Ala | Gly | Val | Tyr | Gln | Ser | Asp | Val | Tyr | Asp | Leu | Pro | Pro | Gly | Val | Tyr |
|     |     |     |     |     | 980 |     |     |     |     | 985 |     |     | 990 |     |     |
| Arg | Thr | Val | Lys | Met | Tyr | Arg | Arg | Asp | Val | Gly | Thr | Trp | Leu | Phe | Tyr |





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| Gly Leu Asn His Leu Asp Ser Val Pro Thr Thr Leu Gly Ala Leu Lys |     |     |
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| Glu Leu His Glu Val Gly Leu His Asp Asn Leu Leu Asn Asn Ile Pro |     |     |
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| Val Ser Ile Ser Lys Leu Pro Lys Leu Lys Lys Leu Asn Ile Lys Arg |     |     |
| 165   | 170 | 175 |
| Asn Pro Phe Pro Lys Pro Gly Glu Ser Glu Ile Phe Ile Asp Ser Ile |     |     |
| 180   | 185 | 190 |
| Arg Arg Leu Glu Asn Leu Tyr Val Val Glu Glu Lys Asp Leu Cys Ala |     |     |
| 195   | 200 | 205 |
| Ala Cys Leu Arg Lys Cys Gln Asn Ala Arg Asp Asn Leu Asn Arg Ile |     |     |
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| Lys Asn Met Ala Thr Thr Thr Pro Arg Lys Thr Ile Phe Pro Asn Leu |     |     |
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Leu Ser Asp Met Asp Glu Leu Asp Leu Ser Arg Asn Leu Ile Arg Lys  
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Ile Pro Asp Ser Ile Ser Lys Phe Gln Asn Leu Arg Trp Leu Asp Leu  
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His Ser Asn Tyr Ile Asp Lys Leu Pro Glu Ser Ile Gly Gln Met Thr  
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Ser Leu Leu Tyr Leu Asn Val Ser Asn Asn Arg Leu Thr Ser Asn Gly  
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Leu Pro Val Glu Leu Lys Gln Leu Lys Asn Ile Arg Ala Val Asn Leu  
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Val Ser Ile Ser Lys Leu Pro Lys Leu Lys Lys Leu Asn Ile Lys Arg  
165 170 175

Asn Pro Phe Pro Lys Pro Gly Glu Ser Glu Ile Phe Ile Asp Ser Ile  
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Ala Cys Leu Arg Lys Cys Gln Asn Ala Arg Asp Asn Leu Asn Arg Ile  
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Phe Val Thr Ala Arg Ala Gly Glu Ser Val Val Leu Arg Cys Asp Val
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Ile His Pro Val Thr Gly Gln Pro Pro Pro Tyr Val Val Glu Trp Phe
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Lys Phe Gly Val Pro Ile Pro Ile Phe Ile Lys Phe Gly Tyr Tyr Pro
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Pro His Val Asp Pro Glu Tyr Ala Gly Lys Val Gly Ala His Gly Leu
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Arg Glu Glu Pro Glu Phe Val Thr Ala Arg Ala Gly Glu Ser Val Val
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Leu Arg Cys Asp Val Ile His Pro Val Thr Gly Gln Pro Pro Pro Tyr
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Val Val Glu Trp Phe Lys Phe Gly Val Pro Ile Pro Ile Phe Ile Lys
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Ser Leu His Asp Lys Ala Ser Leu Arg Leu Glu Gln Val Arg Ser Glu
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| Asp | Gln | Gly | Trp | Tyr | Glu | Cys | Lys | Val | Leu | Met | Leu | Asp | Gln | Gln | Tyr |  |
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| Asp | Thr | Phe | His | Asn | Gly | Ser | Trp | Val | His | Leu | Thr | Ile | Asn | Ala | Pro |  |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |  |
| Pro | Thr | Phe | Thr | Glu | Thr | Pro | Pro | Gln | Tyr | Ile | Glu | Ala | Lys | Glu | Gly |  |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |  |
| Gly | Ser | Ile | Thr | Met | Thr | Cys | Thr | Ala | Phe | Gly | Asn | Pro | Lys | Pro | Ile |  |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |  |
| Val | Thr | Trp | Leu | Lys | Glu | Gly | Thr | Leu | Leu | Gly | Ala | Ser | Gly | Lys | Tyr |  |
|     |     |     | 245 |     |     |     |     | 250 |     |     |     |     |     | 255 |     |  |
| Gln | Val | Ser | Val | Val | Leu | Gly | Ser | Leu | Thr | Val | Thr | Ser | Val | Ser | Arg |  |
|     |     | 260 |     |     |     |     |     | 265 |     |     |     |     | 270 |     |     |  |
| Glu | Asp | Arg | Gly | Ala | Tyr | Thr | Cys | Arg | Ala | Tyr | Ser | Ile | Gln | Gly | Glu |  |
|     | 275 |     |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |  |
| Ala | Val | His | Thr | Thr | His | Leu | Leu | Val | Gln | Gly | Pro | Pro | Phe | Ile | Val |  |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |  |
| Ser | Pro | Pro | Glu | Asn | Ile | Thr | Val | Asn | Ile | Ser | Gln | Asp | Ala | Leu | Leu |  |
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| Thr | Cys | Arg | Ala | Glu | Ala | Tyr | Pro | Gly | Asn | Leu | Thr | Tyr | Thr | Trp | Tyr |  |
|     |     |     | 325 |     |     |     |     | 330 |     |     |     |     |     | 335 |     |  |
| Trp | Gln | Asp | Glu | Asn | Val | Tyr | Phe | Gln | Asn | Asp | Leu | Lys | Leu | Arg | Val |  |
|     |     | 340 |     |     |     |     |     | 345 |     |     |     |     | 350 |     |     |  |
| Arg | Ile | Leu | Ile | Asp | Gly | Thr | Leu | Ile | Ile | Phe | Arg | Val | Lys | Pro | Glu |  |
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| Asp | Ser | Gly | Lys | Tyr | Thr | Cys | Val | Pro | Ser | Asn | Ser | Leu | Gly | Arg | Ser |  |
|     | 370 |     |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |  |
| Pro | Ser | Ala | Ser | Ala | Tyr | Leu | Thr | Val | Gln | Tyr | Pro | Ala | Arg | Val | Leu |  |
| 385 |     |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     | 400 |  |
| Asn | Met | Pro | Pro | Val | Ile | Tyr | Val | Pro | Val | Gly | Ile | His | Gly | Tyr | Ile |  |
|     |     |     | 405 |     |     |     |     |     | 410 |     |     |     |     | 415 |     |  |
| Arg | Cys | Pro | Val | Asp | Ala | Glu | Pro | Pro | Ala | Thr | Val | Val | Lys | Trp | Asn |  |
|     |     | 420 |     |     |     |     |     | 425 |     |     |     |     | 430 |     |     |  |
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| Gly | Thr | Tyr | Thr | Cys | Val | Pro | Tyr | Asn | Thr | Leu | Gly | Thr | Met | Gly | Gln |  |
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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|
| Ile | Phe | Pro | Gln | Pro | Asp | Leu | Thr | Glu | Asp | Gly | Leu | Ala | Arg | Pro | Val | 785  | 790  | 795  | 800  |
| Leu | Ala | Gly | Ile | Val | Ala | Thr | Ile | Cys | Phe | Leu | Ala | Ala | Ala | Ile | Leu | 805  | 810  | 815  |      |
| Phe | Ser | Thr | Leu | Ala | Ala | Cys | Phe | Val | Asn | Lys | Gln | Arg | Lys | Arg | Lys | 820  | 825  | 830  |      |
| Leu | Lys | Arg | Lys | Lys | Asp | Pro | Pro | Leu | Ser | Ile | Thr | His | Cys | Arg | Lys | 835  | 840  | 845  |      |
| Ser | Leu | Glu | Ser | Pro | Leu | Ser | Ser | Gly | Lys | Val | Ser | Pro | Glu | Ser | Ile | 850  | 855  | 860  |      |
| Arg | Thr | Leu | Arg | Ala | Pro | Ser | Glu | Ser | Ser | Asp | Asp | Gln | Gly | Gln | Pro | 865  | 870  | 875  | 880  |
| Ala | Ala | Lys | Arg | Met | Leu | Ser | Pro | Thr | Arg | Glu | Lys | Glu | Leu | Ser | Leu | 885  | 890  | 895  |      |
| Tyr | Lys | Lys | Thr | Lys | Arg | Ala | Ile | Ser | Ser | Lys | Lys | Tyr | Ser | Val | Ala | 900  | 905  | 910  |      |
| Lys | Ala | Glu | Ala | Glu | Ala | Glu | Ala | Thr | Thr | Pro | Ile | Glu | Leu | Ile | Ser | 915  | 920  | 925  |      |
| Arg | Gly | Pro | Asp | Gly | Arg | Phe | Val | Met | Asp | Pro | Val | Glu | Met | Glu | Pro | 930  | 935  | 940  |      |
| Ser | Leu | Lys | Ser | Arg | Arg | Ile | Glu | Gly | Phe | Pro | Phe | Ala | Glu | Glu | Thr | 945  | 950  | 955  | 960  |
| Asp | Met | Tyr | Pro | Glu | Phe | Arg | Gln | Ser | Asp | Glu | Glu | Asn | Glu | Asp | Pro | 965  | 970  | 975  |      |
| Leu | Val | Pro | Thr | Ser | Val | Ala | Ala | Leu | Lys | Ser | Gln | Leu | Thr | Pro | Leu | 980  | 985  | 990  |      |
| Ser | Ser | Ser | Gln | Glu | Ser | Tyr | Leu | Pro | Pro | Pro | Ala | Tyr | Ser | Pro | Arg | 995  | 1000 | 1005 |      |
| Phe | Gln | Pro | Arg | Gly | Leu | Glu | Gly | Pro | Gly | Gly | Leu | Glu | Gly | Arg | Leu | 1010 | 1015 | 1020 |      |
| Gln | Ala | Thr | Gly | Gln | Ala | Arg | Pro | Pro | Ala | Pro | Arg | Pro | Phe | His | His | 1025 | 1030 | 1035 | 1040 |
| Gly | Gln | Tyr | Tyr | Gly | Tyr | Leu | Ser | Ser | Ser | Ser | Pro | Gly | Glu | Val | Glu | 1045 | 1050 | 1055 |      |
| Pro | Pro | Pro | Phe | Tyr | Val | Pro | Glu | Val | Gly | Ser | Pro | Leu | Ser | Ser | Val | 1060 | 1065 | 1070 |      |
| Met | Ser | Ser | Pro | Pro | Leu | Pro | Thr | Glu | Gly | Pro | Phe | Gly | His | Pro | Thr | 1075 | 1080 | 1085 |      |

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                   20                  25                  30  
 Phe Val Thr Ala Arg Ala Gly Glu Ser Val Val Leu Arg Cys Asp Val  
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 Ile His Pro Val Thr Gly Gln Pro Pro Pro Tyr Val Val Glu Trp Phe  
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 Lys Phe Gly Val Pro Ile Pro Ile Phe Ile Lys Phe Gly Tyr Tyr Pro  
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 Pro His Val Asp Pro Glu Tyr Ala Gly Arg Ala Ser Leu His Asp Lys  
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 Ala Ser Leu Arg Leu Glu Gln Val Arg Ser Glu Asp Leu Gly Trp Tyr  
           100                  105                  110  
 Glu Cys Lys Val Leu Met Leu Asp Gln Gln Tyr Asp Thr Phe His Asn  
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 Gly Ser Trp Val His Leu Thr Ile Asn Ala Pro Pro Thr Phe Thr Glu  
       130                  135                  140  
 Thr Pro Pro Arg Tyr Ile Glu Ala Lys Glu Gly Gly Ser Ile Thr Met

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|---|-----|-----|-----|
| 145   | 150 | 155 | 160 |
| Thr Cys Thr Ala Phe Gly Asn Pro Lys Pro Ile Val Thr Trp Leu Lys | 165 | 170 | 175 |
| Glu Gly Thr Leu Leu Gly Ala Ser Gly Lys Tyr Gln Val Ser Asp Gly | 180 | 185 | 190 |
| Ser Leu Thr Val Thr Ser Val Ser Arg Glu Asp Arg Gly Ala Tyr Thr | 195 | 200 | 205 |
| Cys Arg Ala Tyr Ser Ile Gln Gly Glu Ala Val His Thr Thr His Leu | 210 | 215 | 220 |
| Leu Val Pro Gly Pro Pro Phe Ile Val Ser Pro Pro Glu Asn Ile Thr | 225 | 230 | 235 |
| Val Asn Ile Ser Gln Asp Ala Leu Leu Thr Cys Arg Ala Glu Ala Tyr | 245 | 250 | 255 |
| Pro Gly Asn Leu Thr Tyr Thr Trp Tyr Trp Gln Asp Glu Asn Val Tyr | 260 | 265 | 270 |
| Phe Gln Asn Asp Leu Lys Leu Arg Val Arg Ile Leu Ile Asp Gly Thr | 275 | 280 | 285 |
| Leu Ile Ile Phe Arg Val Lys Pro Glu Asp Ser Gly Lys Tyr Thr Cys | 290 | 295 | 300 |
| Val Pro Ser Asn Ser Leu Gly Arg Ser Pro Ser Ala Ser Ala Tyr Leu | 305 | 310 | 315 |
| Thr Val Gln Tyr Pro Ala Arg Val Leu Asn Met Pro Pro Val Ile Tyr | 325 | 330 | 335 |
| Val Pro Val Gly Ile His Gly Tyr Ile Arg Cys Pro Val Asp Ala Arg | 340 | 345 | 350 |
| Pro Pro Ala Thr Val Val Lys Trp Asn Lys Asp Gly Arg Pro Leu Gln | 355 | 360 | 365 |
| Val Glu Lys Asn Arg Gly Trp Thr Leu Met Glu Asp Gly Ser Ile Arg | 370 | 375 | 380 |
| Ile Glu Glu Ala Thr Glu Glu Ala Leu Gly Thr Tyr Thr Cys Val Pro | 385 | 390 | 395 |
| Tyr Asn Thr Leu Gly Thr Met Gly Gln Ser Ala Pro Ala Arg Leu Val | 405 | 410 | 415 |
| Leu Lys Asp Pro Pro Tyr Phe Thr Val Leu Pro Gly Trp Glu Tyr Arg | 420 | 425 | 430 |
| Gln Glu Ala Gly Arg Glu Leu Leu Ile Pro Cys Ala Ala Ala Gly Asp | 435 | 440 | 445 |
| Pro Phe Pro Val Ile Thr Trp Ser Lys Val Gly Lys Pro Ser Arg Ser |     |     |     |

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| Lys His Ser Ala Leu Pro Ser Gly Ser Leu Gln Phe Arg Ala Leu Ser |     |     |     |     |     |
| 465   |     | 470 |     | 475 | 480 |
| Lys Glu Asp His Gly Glu Trp Glu Cys Val Ala Thr Asn Val Val Thr |     |     |     |     |     |
|   | 485 |     | 490 |     | 495 |
| Ser Ile Thr Ala Ser Thr His Leu Thr Val Ile Gly Thr Ser Pro His |     |     |     |     |     |
|   | 500 |     | 505 |     | 510 |
| Ala Pro Gly Ser Val Arg Val Gln Val Ser Met Thr Thr Ala Asn Val |     |     |     |     |     |
|   | 515 |     | 520 |     | 525 |
| Ser Trp Glu Pro Gly Asp Gly Leu Arg Trp Gly Tyr Asp Gly Gly Tyr |     |     |     |     |     |
|   | 530 |     | 535 |     | 540 |
| Glu Gln Thr Phe Ser Val Trp Met Lys Arg Ala Gln Phe Gly Pro His |     |     |     |     |     |
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| Asp Trp Leu Ser Leu Pro Val Pro Pro Gly Pro Ser Trp Leu Leu Val |     |     |     |     |     |
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| Asp Thr Leu Glu Pro Glu Thr Ala Tyr Gln Phe Ser Val Leu Ala Gln |     |     |     |     |     |
|   | 580 |     | 585 |     | 590 |
| Asn Lys Leu Gly Thr Ser Ala Phe Ser Glu Val Val Thr Val Ile Thr |     |     |     |     |     |
|   | 595 |     | 600 |     | 605 |
| Leu Ala Phe Pro Ile Thr Thr Pro Glu Pro Leu Val Leu Val Thr Pro |     |     |     |     |     |
|   | 610 |     | 615 |     | 620 |
| Pro Arg Cys Leu Ile Ala Asn Arg Thr Gln Gln Gly Val Leu Leu Ser |     |     |     |     |     |
|   | 625 |     | 630 |     | 635 |
| Trp Leu Pro Pro Ala Asn His Ser Phe Pro Ile Asp Arg Tyr Ile Met |     |     |     |     |     |
|   | 645 |     | 650 |     | 655 |
| Glu Phe Arg Val Ala Glu Arg Trp Glu Leu Leu Asp Asp Gly Ile Pro |     |     |     |     |     |
|   | 660 |     | 665 |     | 670 |
| Gly Thr Glu Gly Glu Phe Phe Ala Lys Asp Leu Ser Gln Asp Thr Trp |     |     |     |     |     |
|   | 675 |     | 680 |     | 685 |
| Tyr Glu Phe Arg Val Leu Ala Val Met Gln Asp Leu Ile Gly Glu Pro |     |     |     |     |     |
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| Ser Asn Ile Ala Gly Val Ser Ser Thr Asp Ile Phe Pro Gln Pro Asp |     |     |     |     |     |
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| Leu Thr Glu Asp Gly Leu Ala Arg Pro Val Leu Ala Gly Ile Val Ala |     |     |     |     |     |
|   | 725 |     | 730 |     | 735 |
| Thr Ile Cys Phe Leu Ala Ala Ala Ile Leu Phe Ser Thr Leu Ala Ala |     |     |     |     |     |
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| Cys Phe Val Asn Lys Gln Arg Lys Arg Lys Leu Lys Arg Lys Lys Asp |     |     |     |     |     |

| 755  | 760 | 765 |
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| Ser Ser Gly Lys Val Ser Pro Glu Ser Ile Arg Thr Leu Arg Ala Pro<br>785 790 795 800     |     |     |
| Ser Glu Ser Ser Asp Asp Gln Gly Gln Pro Ala Ala Lys Arg Met Leu<br>805 810 815         |     |     |
| Ser Pro Thr Arg Glu Lys Glu Leu Ser Leu Tyr Lys Lys Thr Lys Arg<br>820 825 830         |     |     |
| Ala Ile Ser Ser Lys Lys Tyr Ser Val Ala Lys Ala Glu Ala Glu Ala<br>835 840 845         |     |     |
| Glu Ala Thr Thr Pro Ile Glu Leu Ile Ser Arg Gly Pro Asp Gly Arg<br>850 855 860         |     |     |
| Phe Val Met Asp Pro Val Glu Met Glu Pro Ser Leu Lys Ser Arg Arg<br>865 870 875 880     |     |     |
| Ile Glu Gly Phe Pro Phe Ala Glu Glu Thr Asp Met Tyr Pro Glu Phe<br>885 890 895         |     |     |
| Arg Gln Ser Asp Glu Glu Asn Glu Asp Pro Leu Val Pro Thr Ser Val<br>900 905 910         |     |     |
| Ala Ala Leu Lys Ser Gln Leu Thr Pro Leu Ser Ser Ser Gln Glu Ser<br>915 920 925         |     |     |
| Tyr Leu Pro Pro Pro Ala Tyr Ser Pro Arg Phe Gln Pro Arg Gly Leu<br>930 935 940         |     |     |
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| Arg Pro Pro Ala Pro Arg Pro Phe His His Gly Gln Tyr Tyr Gly Tyr<br>965 970 975         |     |     |
| Leu Ser Ser Ser Ser Pro Gly Glu Val Glu Pro Pro Pro Phe Tyr Val<br>980 985 990         |     |     |
| Pro Glu Val Gly Ser Pro Leu Ser Ser Val Met Ser Ser Pro Pro Leu<br>995 1000 1005       |     |     |
| Pro Thr Glu Gly Pro Phe Gly His Pro Thr Ile Pro Glu Glu Asn Gly<br>1010 1015 1020      |     |     |
| Glu Asn Ala Ser Asn Ser Thr Leu Pro Leu Thr Gln Thr Pro Thr Gly<br>1025 1030 1035 1040 |     |     |
| Gly Arg Ser Pro Glu Pro Trp Gly Arg Pro Glu Phe Pro Phe Gly Gly<br>1045 1050 1055      |     |     |
| Leu Glu Thr Pro Ala Met Met Phe Pro His Gln Leu Pro Pro Cys Asp                        |     |     |

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| Glu Ala Pro Lys Gly Trp Ala Gly Lys Ser Pro Gly Arg Gly Pro Val<br>1105 1110 1115 1120 |      |      |
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| Val Ser Gln Gly Gln Leu Arg His Thr Ser Gln Gly Met Gly Ile Pro<br>1140 1145 1150      |      |      |
| Val Leu Pro Tyr Pro Glu Pro Ala Glu Pro Gly Ala His Gly Gly Pro<br>1155 1160 1165      |      |      |
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| Pro Gly Leu Leu Gln Gln Ala Glu Met Ser Glu Ile Thr Leu Gln Pro<br>1235 1240 1245      |      |      |
| Pro Ala Ala Val Ser Phe Ser Arg Lys Ser Thr Pro Ser Thr Gly Ser<br>1250 1255 1260      |      |      |
| Pro Ser Gln Ser Ser Arg Ser Gly Ser Pro Ser Tyr Arg Pro Ala Met<br>1265 1270 1275 1280 |      |      |
| Gly Phe Thr Thr Leu Ala Thr Gly Tyr Pro Ser Pro Pro Pro Gly Pro<br>1285 1290 1295      |      |      |
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| Ser Pro Arg Arg Thr Gly Glu Glu Leu Leu Arg Pro Glu Thr Pro Pro<br>1315 1320 1325      |      |      |
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 50 55 60  
 Ser Ser Thr Gln Gly Asn Asn Lys Cys Gln Gln Thr Thr Glu Thr Tyr  
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 Cys Phe Cys Glu Thr Val Gln Met Glu Met Leu Ala Pro Lys Gly Pro  
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 Ser Pro Ile Pro Glu Asp Ala Ser Val Lys Glu Glu Asn Ile Cys Arg  
 100 105 110  
 Ala Phe Ser Asp Ala Leu Leu Tyr Lys Ile Glu Asp Ile Asp Asn Lys



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<212> PRT

<213> Homo sapiens

<400> 112

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```

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Glu Glu Ser Pro Leu Ser Pro Pro Pro Glu Ala Ser Arg Leu Ser Pro
    35                      40                      45

```

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Pro Pro Glu Asp Ser Pro Met Ser Pro Pro Pro Glu Glu Ser Pro Met

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| 50  | 55  | 60      |
|---|-----|---------|
| Ser Pro Pro Pro Glu Val Ser Arg Leu Ser Pro Leu Pro Val Val Ser |     |         |
| 65  | 70  | 75 80   |
| Arg Leu Ser Pro Pro Pro Glu Glu Ser Pro Leu Ser Pro Pro Pro Glu |     |         |
|   | 85  | 90 95   |
| Glu Ser Pro Thr Ser Pro Pro Pro Glu Ala Ser Arg Leu Ser Pro Pro |     |         |
|   | 100 | 105 110 |
| Pro Glu Asp Ser Pro Thr Ser Pro Pro Pro Glu Asp Ser Pro Ala Ser |     |         |
|   | 115 | 120 125 |
| Pro Pro Pro Glu Asp Ser Leu Met Ser Leu Pro Leu Glu Glu Ser Pro |     |         |
|   | 130 | 135 140 |
| Leu Leu Pro Leu Pro Glu Glu Pro Gln Leu Cys Pro Arg Ser Glu Gly |     |         |
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| Pro His Leu Ser Pro Arg Pro Glu Glu Pro His Leu Ser Pro Arg Pro |     |         |
|   | 165 | 170 175 |
| Glu Glu Pro His Leu Ser Pro Gln Ala Glu Glu Pro His Leu Ser Pro |     |         |
|   | 180 | 185 190 |
| Gln Pro Glu Glu Pro Cys Leu Cys Ala Val Pro Glu Glu Pro His Leu |     |         |
|   | 195 | 200 205 |
| Ser Pro Gln Ala Glu Gly Pro His Leu Ser Pro Gln Pro Glu Glu Leu |     |         |
|   | 210 | 215 220 |
| His Leu Ser Pro Gln Thr Glu Glu Pro His Leu Ser Pro Val Pro Glu |     |         |
| 225   | 230 | 235 240 |
| Glu Pro Cys Leu Ser Pro Gln Pro Glu Glu Ser His Leu Ser Pro Gln |     |         |
|   | 245 | 250 255 |
| Ser Glu Glu Pro Cys Leu Ser Pro Arg Pro Glu Glu Ser His Leu Ser |     |         |
|   | 260 | 265 270 |
| Pro Glu Leu Glu Lys Pro Pro Leu Ser Pro Arg Pro Glu Lys Pro Pro |     |         |
|   | 275 | 280 285 |
| Glu Glu Pro Gly Gln Cys Pro Ala Pro Glu Glu Leu Pro Leu Phe Pro |     |         |
|   | 290 | 295 300 |
| Pro Pro Gly Glu Pro Ser Leu Ser Pro Leu Leu Gly Glu Pro Ala Leu |     |         |
| 305   | 310 | 315 320 |
| Ser Glu Pro Gly Glu Pro Pro Leu Ser Pro Leu Pro Glu Glu Leu Pro |     |         |
|   | 325 | 330 335 |
| Leu Ser Pro Ser Gly Glu Pro Ser Leu Ser Pro Gln Leu Met Pro Pro |     |         |
|   | 340 | 345 350 |
| Asp Pro Leu Pro Pro Pro Leu Ser Pro Ile Ile Thr Ala Ala Ala Pro |     |         |

|   |  |     |  |     |
|---|--|-----|--|-----|
| 355   |  | 360 |  | 365 |
| Pro Ala Leu Ser Pro Leu Gly Glu Leu Glu Tyr Pro Phe Gly Ala Lys |  |     |  |     |
| 370   |  | 375 |  | 380 |
| Gly Asp Ser Asp Pro Glu Ser Pro Leu Ala Ala Pro Ile Leu Glu Thr |  |     |  |     |
| 385   |  | 390 |  | 400 |
| Pro Ile Ser Pro Pro Pro Glu Ala Asn Cys Thr Asp Pro Glu Pro Val |  |     |  |     |
|   |  | 405 |  | 415 |
| Pro Pro Met Ile Leu Pro Pro Ser Pro Gly Ser Pro Val Gly Pro Ala |  |     |  |     |
|   |  | 420 |  | 430 |
| Ser Pro Ile Leu Met Glu Pro Leu Pro Pro Gln Cys Ser Pro Leu Leu |  |     |  |     |
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| Gln His Ser Leu Val Pro Gln Asn Ser Pro Pro Ser Gln Cys Ser Pro |  |     |  |     |
| 450   |  | 455 |  | 460 |
| Pro Ala Leu Pro Leu Ser Val Pro Ser Pro Leu Ser Pro Ile Gly Lys |  |     |  |     |
| 465   |  | 470 |  | 480 |
| Val Val Gly Val Ser Asp Glu Ala Glu Leu His Glu Met Glu Thr Glu |  |     |  |     |
|   |  | 485 |  | 495 |
| Lys Val Ser Glu Pro Glu Cys Pro Ala Leu Glu Pro Ser Ala Thr Ser |  |     |  |     |
|   |  | 500 |  | 510 |
| Pro Leu Pro Ser Pro Met Gly Asp Leu Ser Cys Pro Ala Pro Ser Pro |  |     |  |     |
|   |  | 515 |  | 525 |
| Ala Pro Ala Leu Asp Asp Phe Ser Gly Leu Gly Glu Asp Thr Ala Pro |  |     |  |     |
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| Leu Asp Gly Ile Asp Ala Pro Gly Ser Gln Pro Glu Pro Gly Gln Thr |  |     |  |     |
| 545   |  | 550 |  | 560 |
| Pro Gly Ser Leu Ala Ser Glu Leu Lys Gly Ser Pro Val Leu Leu Asp |  |     |  |     |
|   |  | 565 |  | 575 |
| Pro Glu Glu Leu Ala Pro Val Thr Pro Met Glu Val Tyr Pro Glu Cys |  |     |  |     |
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| Lys Gln Thr Ala Gly Arg Gly Ser Pro Cys Glu Glu Gln Glu Glu Pro |  |     |  |     |
|   |  | 595 |  | 605 |
| Arg Ala Pro Val Ala Pro Thr Pro Pro Thr Leu Ile Lys Ser Asp Ile |  |     |  |     |
| 610   |  | 615 |  | 620 |
| Val Asn Glu Ile Ser Asn Leu Ser Gln Gly Asp Ala Ser Ala Ser Phe |  |     |  |     |
| 625   |  | 630 |  | 640 |
| Pro Gly Ser Glu Pro Leu Leu Gly Ser Pro Asp Pro Glu Gly Gly Gly |  |     |  |     |
|   |  | 645 |  | 655 |
| Ser Leu Ser Met Glu Leu Gly Val Ser Thr Asp Val Ser Pro Ala Arg |  |     |  |     |



| 660 |     |     |     |     | 665 |     |     |     |     | 670 |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Glu | Gly | Ser | Leu | Arg | Leu | Cys | Thr | Asp | Ser | Leu | Pro | Glu | Thr | Asp |
|     |     | 675 |     |     |     |     | 680 |     |     |     |     | 685 |     |     |     |
| Asp | Ser | Leu | Leu | Cys | Asp | Ala | Gly | Thr | Ala | Ile | Ser | Gly | Gly | Lys | Ala |
|     | 690 |     |     |     |     | 695 |     |     |     |     | 700 |     |     |     |     |
| Glu | Gly | Glu | Lys | Gly | Arg | Arg | Arg | Ser | Ser | Pro | Ala | Arg | Ser | Arg | Ile |
|     | 705 |     |     |     |     | 710 |     |     |     |     | 715 |     |     |     | 720 |
| Lys | Gln | Gly | Arg | Ser | Ser | Ser | Phe | Pro | Gly | Arg | Arg | Arg | Pro | Arg | Gly |
|     |     |     |     | 725 |     |     |     |     | 730 |     |     |     |     | 735 |     |
| Gly | Ala | His | Gly | Gly | Arg | Gly | Arg | Gly | Arg | Ala | Leu | Arg | Lys | Ser | Thr |
|     |     |     | 740 |     |     |     |     | 745 |     |     |     |     | 750 |     |     |
| Ala | Ser | Ser | Ile | Glu | Thr | Leu | Val | Val | Ala | Asp | Ile | Asp | Ser | Ser | Pro |
|     |     |     | 755 |     |     |     | 760 |     |     |     |     | 765 |     |     |     |
| Ser | Lys | Glu | Glu | Glu | Glu | Glu | Asp | Asp | Asp | Thr | Met | Gln | Asn | Thr | Val |
|     | 770 |     |     |     |     | 775 |     |     |     |     | 780 |     |     |     |     |
| Val | Leu | Phe | Ser | Asn | Thr | Asp | Lys | Phe | Val | Leu | Met | Gln | Asp | Met | Cys |
|     | 785 |     |     |     |     | 790 |     |     |     |     | 795 |     |     |     | 800 |
| Val | Val | Cys | Gly | Ser | Phe | Gly | Arg | Gly | Ala | Glu | Gly | His | Leu | Leu | Ala |
|     |     |     |     | 805 |     |     |     |     | 810 |     |     |     |     | 815 |     |
| Cys | Ser | Gln | Cys | Ser | Gln | Cys | Tyr | His | Pro | Tyr | Cys | Val | Asn | Ser | Lys |
|     |     |     | 820 |     |     |     |     | 825 |     |     |     |     | 830 |     |     |
| Ile | Thr | Lys | Val | Met | Leu | Leu | Lys | Gly | Trp | Arg | Cys | Val | Glu | Cys | Ile |
|     |     | 835 |     |     |     |     | 840 |     |     |     |     |     | 845 |     |     |
| Val | Cys | Glu | Val | Cys | Gly | Gln | Ala | Ser | Asp | Pro | Ser | Arg | Leu | Leu | Leu |
|     | 850 |     |     |     |     | 855 |     |     |     |     | 860 |     |     |     |     |
| Cys | Asp | Asp | Cys | Asp | Ile | Ser | Tyr | His | Thr | Tyr | Cys | Leu | Asp | Pro | Pro |
|     | 865 |     |     |     |     | 870 |     |     |     |     | 875 |     |     |     | 880 |
| Leu | Leu | Thr | Val | Pro | Lys | Gly | Gly | Trp | Lys | Cys | Lys | Trp | Cys | Val | Ser |
|     |     |     |     | 885 |     |     |     |     | 890 |     |     |     |     | 895 |     |
| Cys | Met | Gln | Cys | Gly | Ala | Ala | Ser | Pro | Gly | Phe | His | Cys | Glu | Trp | Gln |
|     |     |     | 900 |     |     |     |     | 905 |     |     |     |     | 910 |     |     |
| Asn | Ser | Tyr | Thr | His | Cys | Gly | Pro | Cys | Ala | Ser | Leu | Val | Thr | Cys | Pro |
|     |     | 915 |     |     |     |     | 920 |     |     |     |     | 925 |     |     |     |
| Ile | Cys | His | Ala | Pro | Tyr | Val | Glu | Glu | Asp | Leu | Leu | Ile | Gln | Cys | Arg |
|     | 930 |     |     |     |     | 935 |     |     |     |     | 940 |     |     |     |     |
| His | Cys | Glu | Arg | Trp | Met | His | Ala | Gly | Cys | Glu | Ser | Leu | Phe | Thr | Glu |
|     | 945 |     |     |     |     | 950 |     |     |     |     | 955 |     |     |     | 960 |
| Asp | Asp | Val | Asp | His | Ala | Pro | Asp | Glu | Gly | Phe | Asp | Cys | Val | Ser | Cys |

| 965 |      |      |      |     |      |      |      |      |      | 970  |      |      |      |      |     |  |  |  |  | 975 |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|-----|--|--|--|--|-----|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Gln | Pro  | Tyr  | Val  | Val | Lys  | Pro  | Val  | Ala  | Pro  | Val  | Ala  | Pro  | Pro  | Glu  | Leu |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
|     |      |      | 980  |     |      |      |      | 985  |      |      |      |      |      | 990  |     |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Val | Pro  | Met  | Lys  | Val | Lys  | Glu  | Pro  | Glu  | Pro  | Gln  | Tyr  | Phe  | Arg  | Phe  | Glu |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| Gly | Val  | Trp  | Leu  | Thr | Glu  | Thr  | Gly  | Met  | Ala  | Leu  | Leu  | Arg  | Asn  | Leu  | Thr |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
|     | 1010 |      |      |     |      | 1015 |      |      |      |      |      | 1020 |      |      |     |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Met | Ser  | Pro  | Leu  | His | Lys  | Arg  | Arg  | Gln  | Arg  | Arg  | Gly  | Arg  | Leu  | Gly  | Leu |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
|     | 1025 |      |      |     | 1030 |      |      |      |      | 1035 |      |      |      | 1040 |     |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Pro | Gly  | Glu  | Ala  | Gly | Leu  | Glu  | Gly  | Ser  | Glu  | Pro  | Ser  | Asp  | Ala  | Leu  | Gly |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
|     |      |      | 1045 |     |      |      |      | 1050 |      |      |      |      | 1055 |      |     |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Pro | Asp  | Asp  | Lys  | Lys | Asp  | Gly  | Asp  | Leu  | Asp  | Thr  | Asp  | Glu  | Leu  | Leu  | Lys |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
|     |      | 1060 |      |     |      |      | 1065 |      |      |      |      |      | 1070 |      |     |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Gly | Glu  | Gly  | Gly  | Val | Glu  | His  | Met  | Glu  | Cys  | Glu  | Ile  | Lys  | Leu  | Glu  | Gly |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
|     | 1075 |      |      |     |      | 1080 |      |      |      |      |      | 1085 |      |      |     |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Pro | Val  | Ser  | Pro  | Asp | Val  | Glu  | Pro  | Gly  | Lys  | Glu  | Glu  | Thr  | Glu  | Glu  | Ser |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
|     | 1090 |      |      |     | 1095 |      |      |      |      | 1100 |      |      |      |      |     |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Lys | Lys  | Arg  | Lys  | Arg | Lys  | Pro  | Tyr  | Arg  | Pro  | Gly  | Ile  | Gly  | Gly  | Phe  | Met |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
|     | 1105 |      |      |     | 1110 |      |      |      | 1115 |      |      |      | 1120 |      |     |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Val | Arg  | Gln  | Arg  | Lys | Ser  | His  | Thr  | Arg  | Thr  | Lys  | Lys  | Gly  | Pro  | Ala  | Ala |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
|     |      |      | 1125 |     |      |      | 1130 |      |      |      |      |      | 1135 |      |     |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Gln | Ala  | Glu  | Val  | Leu | Ser  | Gly  | Asp  | Gly  | Gln  | Pro  | Asp  | Glu  | Val  | Ile  | Pro |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
|     | 1140 |      |      |     |      | 1145 |      |      |      |      |      | 1150 |      |      |     |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Ala | Asp  | Leu  | Pro  | Ala | Glu  | Gly  | Ala  | Val  | Glu  | Gln  | Ser  | Leu  | Ala  | Glu  | Gly |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
|     | 1155 |      |      |     |      | 1160 |      |      |      |      | 1165 |      |      |      |     |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Asp | Glu  | Lys  | Lys  | Lys | Gln  | Gln  | Arg  | Arg  | Gly  | Arg  | Lys  | Arg  | Ser  | Lys  | Leu |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
|     | 1170 |      |      |     | 1175 |      |      |      | 1180 |      |      |      |      |      |     |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Glu | Gly  | Met  | Phe  | Pro | Ala  | Tyr  | Leu  | Gln  | Glu  | Ala  | Phe  | Phe  | Gly  | Lys  | Glu |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
|     | 1185 |      |      |     | 1190 |      |      |      | 1195 |      |      |      | 1200 |      |     |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Leu | Leu  | Asp  | Leu  | Ser | Arg  | Lys  | Ala  | Leu  | Phe  | Ala  | Val  | Gly  | Val  | Gly  | Arg |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
|     |      | 1205 |      |     |      |      | 1210 |      |      |      |      |      | 1215 |      |     |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Pro | Ser  | Phe  | Gly  | Leu | Gly  | Thr  | Pro  | Lys  | Ala  | Lys  | Gly  | Asp  | Gly  | Gly  | Ser |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
|     | 1220 |      |      |     |      | 1225 |      |      |      |      |      | 1230 |      |      |     |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Glu | Arg  | Lys  | Glu  | Leu | Pro  | Thr  | Ser  | Gln  | Lys  | Gly  | Asp  | Asp  | Gly  | Pro  | Asp |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
|     | 1235 |      |      |     | 1240 |      |      |      |      |      | 1245 |      |      |      |     |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Ile | Ala  | Asp  | Glu  | Glu | Ser  | Arg  | Gly  | Leu  | Glu  | Gly  | Lys  | Ala  | Asp  | Thr  | Pro |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
|     | 1250 |      |      |     | 1255 |      |      |      |      |      | 1260 |      |      |      |     |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Gly | Pro  | Glu  | Asp  | Gly | Gly  | Val  | Lys  | Ala  | Ser  | Pro  | Val  | Pro  | Ser  | Asp  | Pro |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |  |  |

|   |   |      |      |
|---|---|------|------|
| 1265  | 1270  | 1275 | 1280 |
| Glu Lys Pro Gly Thr   | Pro Gly Glu Gly Met Leu Ser Ser Asp Leu Asp     |      |      |
| 1285  | 1290  | 1295 |      |
| Arg Ile Ser Thr   | Glu Glu Leu Pro Lys Met Glu Ser Lys Asp Leu Gln |      |      |
| 1300  | 1305  | 1310 |      |
| Gln Leu Phe Lys Asp Val   | Leu Gly Ser Glu Arg Glu Gln His Leu Gly         |      |      |
| 1315  | 1320  | 1325 |      |
| Cys Gly Thr Pro Gly Leu Glu Gly Ser Arg Thr Pro Leu Gln Arg Pro |   |      |      |
| 1330  | 1335  | 1340 |      |
| Phe Leu Gln Gly Gly Leu Pro Leu Gly Asn Leu Pro Ser Ser Ser Pro |   |      |      |
| 1345  | 1350  | 1355 | 1360 |
| Met Asp Ser Tyr Pro Gly Leu Cys Gln Ser Pro Phe Leu Asp Ser Arg |   |      |      |
| 1365  | 1370  | 1375 |      |
| Glu Arg Gly Gly Phe Phe Ser Pro Glu Pro Gly Glu Pro Asp Ser Pro |   |      |      |
| 1380  | 1385  | 1390 |      |
| Trp Thr Gly Ser Gly Gly Thr Thr Pro Ser Thr Pro Thr Thr Pro Thr |   |      |      |
| 1395  | 1400  | 1405 |      |
| Thr Glu Gly Glu Gly Asp Gly Leu Ser Tyr Asn Gln Arg Ser Leu Gln |   |      |      |
| 1410  | 1415  | 1420 |      |
| Arg Trp Glu Lys Asp Glu Glu Leu Gly Gln Leu Ser Thr Ile Ser Pro |   |      |      |
| 1425  | 1430  | 1435 | 1440 |
| Val Leu Tyr Ala Asn Ile Asn Phe Pro Asn Leu Lys Gln Asp Tyr Pro |   |      |      |
| 1445  | 1450  | 1455 |      |
| Asp Trp Ser Ser Arg Cys Lys Gln Ile Met Lys Leu Trp Arg Lys Val |   |      |      |
| 1460  | 1465  | 1470 |      |
| Pro Ala Ala Asp Lys Ala Pro Tyr Leu Gln Lys Ala Lys Asp Asn Arg |   |      |      |
| 1475  | 1480  | 1485 |      |
| Ala Ala His Arg Ile Asn Lys Val Gln Lys Gln Ala Glu Ser Gln Ile |   |      |      |
| 1490  | 1495  | 1500 |      |
| Asn Lys Gln Thr Lys Val Gly Asp Ile Ala Arg Lys Thr Asp Arg Pro |   |      |      |
| 1505  | 1510  | 1515 | 1520 |
| Ala Leu His Leu Arg Ile Pro Pro Gln Pro Gly Ala Leu Gly Ser Pro |   |      |      |
| 1525  | 1530  | 1535 |      |
| Pro Pro Ala Ala Ala Pro Thr Ile Phe Ile Gly Ser Pro Thr Thr Pro |   |      |      |
| 1540  | 1545  | 1550 |      |
| Ala Gly Leu Ser Thr Ser Ala Asp Gly Phe Leu Lys Pro Pro Ala Gly |   |      |      |
| 1555  | 1560  | 1565 |      |
| Ser Val Pro Gly Pro Asp Ser Pro Gly Glu Leu Phe Leu Lys Leu Pro |   |      |      |

|   |                             |                         |
|---|-----------------------------|-------------------------|
| 1570  | 1575                        | 1580                    |
| Pro Gln Val   | Pro Ala Gln Ala             | Pro Ser Gln Asp         |
| 1585  | 1590                        | 1595                    |
| Pro Phe Gly Leu Ala   |                             | 1600                    |
| Pro Ala Tyr   | Pro Leu Glu                 | Pro Arg Phe             |
| 1605  | 1610                        | 1615                    |
| Pro Pro Tyr   | Pro Ser Pro Thr Gly Ala     | Pro Ala Gln             |
| 1620  | 1625                        | 1630                    |
| Pro Pro Met Leu   |                             |                         |
| Gly Ala Ser   | Ser Arg Pro Gly Ala Gly Gln | Pro Gly Glu Phe His Thr |
| 1635  | 1640                        | 1645                    |
| Thr Pro Pro Gly Thr   | Pro Arg His Gln             | Pro Ser Thr             |
| 1650  | 1655                        | 1660                    |
| Pro Asp Pro Phe   |                             |                         |
| Leu Lys Pro Arg Cys   | Pro Ser Leu Asp Asn         | Leu Ala Val             |
| 1665  | 1670                        | 1675                    |
| Pro Glu Ser   |                             | 1680                    |
| Pro Gly Val Gly Gly Gly Lys Ala Ser Glu                         | Pro Leu Leu Ser             | Pro Pro                 |
| 1685  | 1690                        | 1695                    |
| Pro Phe Gly Glu Ser Arg Lys Ala Leu Glu Val Lys Lys Glu Glu Leu |                             |                         |
| 1700  | 1705                        | 1710                    |
| Gly Ala Ser Ser Pro Ser Tyr Gly Pro Pro Asn Leu Gly Phe Val Asp |                             |                         |
| 1715  | 1720                        | 1725                    |
| Ser Pro Ser Ser Gly Thr His Leu Gly Gly Leu Glu Leu Lys Thr Pro |                             |                         |
| 1730  | 1735                        | 1740                    |
| Asp Val Phe Lys Ala Pro Leu Thr Pro Arg Ala Ser Gln Val Glu Pro |                             |                         |
| 1745  | 1750                        | 1755                    |
| Gln Ser Pro Gly Leu Gly Leu Arg Pro Gln Glu Pro Pro Pro Ala Gln |                             |                         |
| 1765  | 1770                        | 1775                    |
| Ala Leu Ala Pro Ser Pro Pro Ser His Pro Asp Ile Phe Arg Pro Gly |                             |                         |
| 1780  | 1785                        | 1790                    |
| Ser Tyr Thr Asp Pro Tyr Ala Gln Pro Pro Leu Thr Pro Arg Pro Gln |                             |                         |
| 1795  | 1800                        | 1805                    |
| Pro Pro Pro Pro Glu Ser Cys Cys Ala Leu Pro Pro Arg Ser Leu Pro |                             |                         |
| 1810  | 1815                        | 1820                    |
| Ser Asp Pro Phe Ser Arg Val Pro Val Ser Pro Gln Ser Gln Ser Ser |                             |                         |
| 1825  | 1830                        | 1835                    |
| Ser Gln Ser Pro Leu Thr Pro Arg Pro Leu Ser Ala Glu Ala Phe Cys |                             |                         |
| 1845  | 1850                        | 1855                    |
| Pro Ser Pro Val Thr Pro Arg Phe Gln Ser Pro Asp Pro Tyr Ser Arg |                             |                         |
| 1860  | 1865                        | 1870                    |
| Pro Pro Ser Arg Pro Gln Ser Arg Asp Pro Phe Ala Pro Leu His Lys |                             |                         |

|   |      |           |
|---|------|-----------|
| 1875  | 1880 | 1885      |
| Pro Pro Arg Pro Gln Pro Pro Glu Val Ala Phe Lys Ala Gly Ser Leu |      |           |
| 1890  | 1895 | 1900      |
| Ala His Thr Ser Leu Gly Ala Gly Gly Phe Pro Ala Ala Leu Pro Ala |      |           |
| 1905  | 1910 | 1915 1920 |
| Gly Pro Ala Gly Glu Leu His Ala Lys Val Pro Ser Gly Gln Pro Pro |      |           |
|   | 1925 | 1930 1935 |
| Asn Phe Val Arg Ser Pro Gly Thr Gly Ala Phe Val Gly Thr Pro Ser |      |           |
|   | 1940 | 1945 1950 |
| Pro Met Arg Phe Thr Phe Pro Gln Ala Val Gly Glu Pro Ser Leu Lys |      |           |
|   | 1955 | 1960 1965 |
| Pro Pro Val Pro Gln Pro Gly Leu Pro Pro Pro His Gly Ile Asn Ser |      |           |
|   | 1970 | 1975 1980 |
| His Phe Gly Pro Gly Pro Thr Leu Gly Lys Pro Gln Ser Thr Asn Tyr |      |           |
| 1985  | 1990 | 1995 2000 |
| Thr Val Ala Thr Gly Asn Phe His Pro Ser Gly Ser Pro Leu Gly Pro |      |           |
|   | 2005 | 2010 2015 |
| Ser Ser Gly Ser Thr Gly Glu Ser Tyr Gly Leu Ser Pro Leu Arg Pro |      |           |
|   | 2020 | 2025 2030 |
| Pro Ser Val Leu Pro Pro Pro Ala Pro Asp Gly Ser Leu Pro Tyr Leu |      |           |
|   | 2035 | 2040 2045 |
| Ser His Gly Ala Ser Gln Arg Ser Gly Ile Thr Ser Pro Val Glu Lys |      |           |
|   | 2050 | 2055 2060 |
| Arg Glu Asp Pro Gly Thr Gly Met Gly Ser Ser Leu Ala Thr Ala Glu |      |           |
| 2065  | 2070 | 2075 2080 |
| Leu Pro Gly Thr Gln Asp Pro Gly Met Ser Gly Leu Ser Gln Thr Glu |      |           |
|   | 2085 | 2090 2095 |
| Leu Glu Lys Gln Arg Gln Arg Gln Arg Leu Arg Glu Leu Leu Ile Arg |      |           |
|   | 2100 | 2105 2110 |
| Gln Gln Ile Gln Arg Asn Thr Leu Arg Gln Glu Lys Glu Thr Ala Ala |      |           |
|   | 2115 | 2120 2125 |
| Ala Ala Ala Gly Ala Val Gly Pro Pro Gly Ser Trp Gly Ala Glu Pro |      |           |
|   | 2130 | 2135 2140 |
| Ser Ser Pro Ala Phe Glu Gln Leu Ser Arg Gly Gln Thr Pro Phe Ala |      |           |
| 2145  | 2150 | 2155 2160 |
| Gly Thr Gln Asp Lys Ser Ser Leu Val Gly Leu Pro Pro Ser Lys Leu |      |           |
|   | 2165 | 2170 2175 |
| Ser Gly Pro Ile Leu Gly Pro Gly Ser Phe Pro Ser Asp Asp Arg Leu |      |           |

| 2180  | 2185 | 2190 |
|---|------|------|
| Ser Arg Pro Pro Pro Pro Ala Thr Pro Ser Ser Met Asp Val Asn Ser |      |      |
| 2195  | 2200 | 2205 |
| Arg Gln Leu Val Gly Gly Ser Gln Ala Phe Tyr Gln Arg Ala Pro Tyr |      |      |
| 2210  | 2215 | 2220 |
| Pro Gly Ser Leu Pro Leu Gln Gln Gln Gln Gln Leu Trp Gln Gln     |      |      |
| 2225  | 2230 | 2240 |
| Gln Gln Ala Thr Ala Ala Thr Ser Met Arg Phe Ala Met Ser Ala Arg |      |      |
| 2245  | 2250 | 2255 |
| Phe Pro Ser Thr Pro Gly Pro Glu Leu Gly Arg Gln Ala Leu Gly Ser |      |      |
| 2260  | 2265 | 2270 |
| Pro Leu Ala Gly Ile Ser Thr Arg Leu Pro Gly Pro Gly Glu Pro Val |      |      |
| 2275  | 2280 | 2285 |
| Pro Gly Pro Ala Gly Pro Ala Gln Phe Ile Glu Leu Arg His Asn Val |      |      |
| 2290  | 2295 | 2300 |
| Gln Lys Gly Leu Gly Pro Gly Gly Thr Pro Phe Pro Gly Gln Gly Pro |      |      |
| 2305  | 2310 | 2320 |
| Pro Gln Arg Pro Arg Phe Tyr Pro Val Ser Glu Asp Pro His Arg Leu |      |      |
| 2325  | 2330 | 2335 |
| Ala Pro Glu Gly Leu Arg Gly Leu Ala Val Ser Gly Leu Pro Pro Gln |      |      |
| 2340  | 2345 | 2350 |
| Lys Pro Ser Ala Pro Pro Ala Pro Glu Leu Asn Asn Ser Leu His Pro |      |      |
| 2355  | 2360 | 2365 |
| Thr Pro His Thr Lys Gly Pro Thr Leu Pro Thr Gly Leu Glu Leu Val |      |      |
| 2370  | 2375 | 2380 |
| Asn Arg Pro Pro Ser Ser Thr Glu Leu Gly Arg Pro Asn Pro Leu Ala |      |      |
| 2385  | 2390 | 2395 |
| Leu Glu Ala Gly Lys Leu Pro Cys Glu Asp Pro Glu Leu Asp Asp Asp |      |      |
| 2405  | 2410 | 2415 |
| Phe Asp Ala His Lys Ala Leu Glu Asp Asp Glu Glu Leu Ala His Leu |      |      |
| 2420  | 2425 | 2430 |
| Gly Leu Gly Val Asp Val Ala Lys Gly Asp Asp Glu Leu Gly Thr Leu |      |      |
| 2435  | 2440 | 2445 |
| Glu Asn Leu Glu Thr Asn Asp Pro His Leu Asp Asp Leu Leu Asn Gly |      |      |
| 2450  | 2455 | 2460 |
| Asp Glu Phe Asp Leu Leu Ala Tyr Thr Asp Pro Glu Leu Asp Thr Gly |      |      |
| 2465  | 2470 | 2475 |
| Asp Lys Lys Asp Ile Phe Asn Glu His Leu Arg Leu Val Glu Ser Ala |      |      |

|   |      |      |
|---|------|------|
| 2485  | 2490 | 2495 |
| Asn Glu Glu Ala Glu Arg Glu Ala Leu Leu Arg Gly Val Glu Pro Gly |      |      |
| 2500  | 2505 | 2510 |
| Pro Leu Gly Pro Glu Glu Arg Pro Pro Pro Ala Ala Asp Ala Ser Glu |      |      |
| 2515  | 2520 | 2525 |
| Pro Arg Leu Ala Ser Val Leu Pro Glu Val Lys Pro Lys Val Glu Glu |      |      |
| 2530  | 2535 | 2540 |
| Gly Gly Arg His Pro Ser Pro Cys Gln Phe Thr Ile Ala Thr Pro Lys |      |      |
| 2545  | 2550 | 2555 |
|   |      | 2560 |
| Val Glu Pro Ala Pro Ala Ala Asn Ser Leu Gly Leu Gly Leu Lys Pro |      |      |
| 2565  | 2570 | 2575 |
| Gly Gln Ser Met Met Gly Ser Arg Asp Thr Arg Met Gly Thr Gly Pro |      |      |
| 2580  | 2585 | 2590 |
| Phe Ser Ser Ser Gly His Thr Ala Glu Lys Ala Ser Phe Gly Ala Thr |      |      |
| 2595  | 2600 | 2605 |
| Gly Gly Pro Pro Ala His Leu Leu Thr Pro Ser Pro Leu Ser Gly Pro |      |      |
| 2610  | 2615 | 2620 |
| Gly Gly Ser Ser Leu Leu Glu Lys Phe Glu Leu Glu Ser Gly Ala Leu |      |      |
| 2625  | 2630 | 2635 |
|   |      | 2640 |
| Thr Leu Pro Gly Gly Pro Ala Ala Ser Gly Asp Glu Leu Asp Lys Met |      |      |
| 2645  | 2650 | 2655 |
| Glu Ser Ser Leu Val Ala Ser Glu Leu Pro Leu Leu Ile Glu Asp Leu |      |      |
| 2660  | 2665 | 2670 |
| Leu Glu His Glu Lys Lys Glu Leu Gln Lys Lys Gln Gln Leu Ser Ala |      |      |
| 2675  | 2680 | 2685 |
| Gln Leu Gln Pro Ala Gln Gln Gln Gln Gln Gln Gln Gln His Ser     |      |      |
| 2690  | 2695 | 2700 |
| Leu Leu Pro Ala Pro Gly Pro Ala Gln Ala Met Ser Leu Pro His Glu |      |      |
| 2705  | 2710 | 2715 |
|   |      | 2720 |
| Gly Ser Ser Pro Ser Leu Ala Gly Ser Gln Gln Gln Leu Ser Leu Gly |      |      |
| 2725  | 2730 | 2735 |
| Leu Ala Val Ala Arg Gln Pro Gly Leu Pro Gln Pro Leu Met Pro Thr |      |      |
| 2740  | 2745 | 2750 |
| Gln Pro Pro Ala His Ala Leu Gln Gln Arg Leu Ala Pro Ser Met Ala |      |      |
| 2755  | 2760 | 2765 |
| Met Val Ser Asn Gln Gly His Met Leu Ser Gly Gln His Gly Gly Gln |      |      |
| 2770  | 2775 | 2780 |
| Ala Gly Leu Val Pro Gln Gln Ser Ser Gln Pro Val Leu Ser Gln Lys |      |      |

|   |   |      |      |      |      |      |
|---|---|------|------|------|------|------|
| 2785  |   | 2790 |      | 2795 |      | 2800 |
| Pro Met Gly Thr Met   | Pro Pro Ser Met Cys Met Lys Pro Gln Gln Leu |      |      |      |      |      |
|   | 2805  |      | 2810 |      | 2815 |      |
| Ala Met Gln Gln Gln Leu Ala Asn Ser Phe Phe Pro Asp Thr Asp Leu |   |      |      |      |      |      |
|   | 2820  |      | 2825 |      | 2830 |      |
| Asp Lys Phe Ala Ala Glu Asp Ile Ile Gly Pro Ile Ala Lys Ala Lys |   |      |      |      |      |      |
|   | 2835  |      | 2840 |      | 2845 |      |
| Met Val Ala Leu Lys Gly Ile Lys Lys Val Met Ala Gln Gly Ser Ile |   |      |      |      |      |      |
|   | 2850  |      | 2855 |      | 2860 |      |
| Gly Val Ala Pro Gly Met Asn Arg Gln Gln Val Ser Leu Leu Ala Gln |   |      |      |      |      |      |
|   | 2865  |      | 2870 |      | 2875 | 2880 |
| Arg Leu Ser Gly Gly Pro Ser Ser Asp Leu Gln Asn His Val Ala Ala |   |      |      |      |      |      |
|   | 2885  |      | 2890 |      | 2895 |      |
| Gly Ser Gly Gln Glu Arg Ser Ala Gly Asp Pro Ser Gln Pro Arg Pro |   |      |      |      |      |      |
|   | 2900  |      | 2905 |      | 2910 |      |
| Asn Pro Pro Thr Phe Ala Gln Gly Val Ile Asn Glu Ala Asp Gln Arg |   |      |      |      |      |      |
|   | 2915  |      | 2920 |      | 2925 |      |
| Gln Tyr Glu Glu Trp Leu Phe His Thr Gln Gln Leu Leu Gln Met Gln |   |      |      |      |      |      |
|   | 2930  |      | 2935 |      | 2940 |      |
| Leu Lys Val Leu Glu Glu Gln Ile Gly Val His Arg Lys Ser Arg Lys |   |      |      |      |      |      |
|   | 2945  |      | 2950 |      | 2955 | 2960 |
| Ala Leu Cys Ala Lys Gln Arg Thr Ala Lys Lys Ala Gly Arg Glu Phe |   |      |      |      |      |      |
|   | 2965  |      | 2970 |      | 2975 |      |
| Pro Glu Ala Asp Ala Glu Lys Leu Lys Leu Val Thr Glu Gln Gln Ser |   |      |      |      |      |      |
|   | 2980  |      | 2985 |      | 2990 |      |
| Lys Ile Gln Lys Gln Leu Asp Gln Val Arg Lys Gln Gln Lys Glu His |   |      |      |      |      |      |
|   | 2995  |      | 3000 |      | 3005 |      |
| Thr Asn Leu Met Ala Glu Tyr Arg Asn Lys Gln Gln Gln Gln Gln     |   |      |      |      |      |      |
|   | 3010  |      | 3015 |      | 3020 |      |
| Gln Gln Gln Gln Gln Gln Gln Gln His Ser Ala Val Leu Ala Leu Ser |   |      |      |      |      |      |
|   | 3025  |      | 3030 |      | 3035 | 3040 |
| Pro Ser Gln Ser Pro Arg Leu Leu Thr Lys Leu Pro Gly Gln Leu Leu |   |      |      |      |      |      |
|   | 3045  |      | 3050 |      | 3055 |      |
| Pro Gly His Gly Leu Gln Pro Pro Gln Gly Pro Pro Gly Gly Gln Ala |   |      |      |      |      |      |
|   | 3060  |      | 3065 |      | 3070 |      |
| Gly Gly Leu Arg Leu Thr Pro Gly Gly Met Ala Leu Pro Gly Gln Pro |   |      |      |      |      |      |
|   | 3075  |      | 3080 |      | 3085 |      |
| Gly Gly Pro Phe Leu Asn Thr Ala Leu Ala Gln Gln Gln Gln Gln     |   |      |      |      |      |      |



|   |      |           |
|---|------|-----------|
| 3090  | 3095 | 3100      |
| His Ser Gly Gly Ala Gly Ser Leu Ala Gly Pro Ser Gly Gly Phe Phe |      |           |
| 3105  | 3110 | 3115 3120 |
| Pro Gly Asn Leu Ala Leu Arg Ser Leu Gly Pro Asp Ser Arg Leu Leu |      |           |
|   | 3125 | 3130 3135 |
| Gln Glu Arg Gln Leu Gln Leu Gln Gln Gln Arg Met Gln Leu Ala Gln |      |           |
|   | 3140 | 3145 3150 |
| Lys Leu Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln His Leu Leu     |      |           |
|   | 3155 | 3160 3165 |
| Gly Gln Val Ala Ile Gln Gln Gln Gln Gln Gln Gly Pro Gly Val Gln |      |           |
|   | 3170 | 3175 3180 |
| Thr Asn Gln Ala Leu Gly Pro Lys Pro Gln Gly Leu Met Pro Pro Ser |      |           |
| 3185  | 3190 | 3195 3200 |
| Ser His Gln Gly Leu Leu Val Gln Gln Leu Ser Pro Gln Pro Pro Gln |      |           |
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| Gly Pro Gln Gly Met Leu Gly Pro Ala Gln Val Ala Val Leu Gln Gln |      |           |
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| Gln His Pro Gly Ala Leu Gly Pro Gln Gly Pro His Arg Gln Val Leu |      |           |
|   | 3235 | 3240 3245 |
| Met Thr Gln Ser Arg Val Leu Ser Ser Pro Gln Leu Ala Gln Gln Gly |      |           |
|   | 3250 | 3255 3260 |
| Gln Gly Leu Met Gly His Arg Leu Val Thr Ala Gln Gln Gln Gln Gln |      |           |
| 3265  | 3270 | 3275 3280 |
| Gln Gln Gln His Gln Gln Gln Gly Ser Met Ala Gly Leu Ser His Leu |      |           |
|   | 3285 | 3290 3295 |
| Gln Gln Ser Leu Met Ser His Ser Gly Gln Pro Lys Leu Ser Ala Gln |      |           |
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| Pro Met Gly Ser Leu Gln Gln Leu Gln Gln Gln Gln Gln Leu Gln Gln |      |           |
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| Gln Leu Gln Gln Gln Gln Leu Gln Gln Gln Gln Gln Gln Gln Leu     |      |           |
| 3345  | 3350 | 3355 3360 |
| Gln Gln Gln Gln Gln Gln Gln Leu Gln Gln Gln Gln Gln Leu Gln     |      |           |
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| Gln Gln Gln Gln Gln Gln Gln Gln Phe Gln Gln Gln Gln Gln Gln     |      |           |
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| Gln Gln Met Gly Leu Leu Asn Gln Ser Arg Thr Leu Leu Ser Pro Gln |      |           |

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| Leu Thr Gly Lys Glu Gln Asn Thr Val Asp Pro Ala Val Ser Ser Glu |      |                |
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| Ala Thr Glu Gly Pro Ser Thr His Gln Gly Gly Pro Leu Ala Ile Gly |      |                |
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| Thr Thr Pro Glu Ser Met Ala Thr Glu Pro Gly Glu Val Lys Pro Ser |      |                |
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| Gln Pro Ser Ser Leu Gln Leu Gln Pro Pro Leu Arg Leu Pro Gly Gln |      |                |
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| Leu Leu Ala Gln Pro Ser Val Ser Leu Gly Asp Gln Pro Gly Ser Met |      |                |
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| Gln Asn Asn Thr Gly Pro Gln Pro Pro Lys Pro Gly Pro Val Leu Gln |      |                |
|   | 3585 | 3590 3595 3600 |
| Ser Gly Gln Gly Leu Pro Gly Val Gly Ile Met Pro Thr Val Gly Gln |      |                |
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| Leu Arg Ala Gln Leu Gln Gly Val Leu Ala Lys Asn Pro Gln Leu Arg |      |                |
|   | 3620 | 3625 3630      |
| His Leu Ser Pro Gln Gln Gln Gln Gln Leu Gln Ala Leu Leu Met Gln |      |                |
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| Arg Gln Leu Gln Gln Ser Gln Ala Val Arg Gln Thr Pro Pro Tyr Gln |      |                |
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| Glu Pro Gly Thr Gln Thr Ser Pro Leu Gln Gly Leu Leu Gly Cys Gln |      |                |
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| Pro Gln Leu Gly Gly Phe Pro Gly Pro Gln Thr Gly Pro Leu Gln Glu |      |                |
|   | 3685 | 3690 3695      |
| Leu Gly Ala Gly Pro Arg Pro Gln Gly Pro Pro Arg Leu Pro Ala Pro |      |                |

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| Pro Pro Pro Ser Ser Pro Gln Glu Pro Lys Arg Pro Ser Gln Leu Pro |           |           |
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| Ser Pro Ser Ser Gln Leu Pro Thr Glu Ala Gln Leu Pro Pro Thr His |           |           |
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| Pro Gly Thr Pro Lys Pro Gln Gly Pro Thr Leu Glu Pro Pro Pro Gly |           |           |
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| Gly Leu Gly Pro Trp Asp Pro Pro Asp Asn Leu Ala Glu Thr Gln Lys |           |           |
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| Pro Glu Gln Ser Ser Leu Val Pro Gly His Leu Asp Gln Val Asn Gly |           |           |
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| Gln Val Val Pro Glu Ala Ser Gln Leu Ser Ile Lys Gln Glu Pro Arg |           |           |
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| Glu Glu Pro Cys Ala Leu Gly Ala Gln Ser Val Lys Arg Glu Ala Asn |           |           |
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| Gly Glu Pro Ile Gly Ala Pro Gly Thr Ser Asn His Leu Leu Leu Ala |           |           |
|   | 3860 3865 | 3870      |
| Gly Pro Arg Ser Glu Ala Gly His Leu Leu Leu Gln Lys Leu Leu Arg |           |           |
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| Ala Lys Asn Val Gln Leu Ser Thr Gly Gln Gly Ser Glu Gly Leu Arg |           |           |
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| Lys Leu Gln Gly Thr Pro Ser Asn Lys Glu Asp Ala Ala Ala Arg Lys |           |           |
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| Pro Leu Thr Pro Lys Pro Lys Arg Val Gln Lys Ala Ser Asp Arg Leu |           |           |
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| Val Ser Ser Arg Lys Lys Leu Arg Lys Glu Asp Gly Val Arg Ala Ser |           |           |
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| Glu Ala Leu Leu Lys Gln Leu Lys Gln Glu Leu Ser Leu Leu Pro Leu |           |           |
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| Thr Glu Pro Ala Ile Thr Ala Asn Phe Ser Leu Phe Ala Pro Phe Gly |           |           |
|   | 3985 3990 | 3995 4000 |
| Ser Gly Cys Pro Val Asn Gly Gln Ser Gln Leu Arg Gly Ala Phe Gly |           |           |

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| Lys Asn Asn Leu Ser Asn Pro Pro Thr Pro Pro Ser Ser Leu Pro Pro<br>4035 | 4040 | 4045      |
| Thr Pro Pro Pro Ser Val Gln Gln Lys Met Val Asn Gly Val Thr Pro<br>4050 | 4055 | 4060      |
| Ser Glu Glu Leu Gly Glu His Pro Lys Asp Ala Ala Ser Ala Arg Asp<br>4065 | 4070 | 4075 4080 |
| Ser Glu Arg Ala Leu Arg Asp Thr Ser Glu Val Lys Ser Leu Asp Leu<br>4085 | 4090 | 4095      |
| Leu Ala Ala Leu Pro Thr Pro Pro His Asn Gln Thr Glu Asp Val Arg<br>4100 | 4105 | 4110      |
| Met Glu Ser Asp Glu Asp Ser Asp Ser Pro Asp Ser Ile Val Pro Ala<br>4115 | 4120 | 4125      |
| Ser Ser Pro Glu Ser Ile Leu Gly Glu Glu Ala Pro Arg Phe Pro His<br>4130 | 4135 | 4140      |
| Leu Gly Ser Gly Arg Trp Glu Gln Glu Asp Arg Ala Leu Ser Pro Val<br>4145 | 4150 | 4155 4160 |
| Ile Pro Leu Ile Pro Arg Asp Ser Ile Pro Val Phe Pro Asp Thr Lys<br>4165 | 4170 | 4175      |
| Pro Tyr Gly Ala Leu Gly Leu Glu Val Pro Gly Lys Leu Pro Val Thr<br>4180 | 4185 | 4190      |
| Thr Trp Glu Lys Gly Lys Gly Ser Glu Val Ser Val Met Leu Thr Val<br>4195 | 4200 | 4205      |
| Ser Ala Ala Ala Asp Lys Asn Leu Asn Gly Val Met Val Ala Val Ala<br>4210 | 4215 | 4220      |
| Glu Leu Leu Ser Met Lys Ile Pro Asn Ser Tyr Glu Val Leu Phe Pro<br>4225 | 4230 | 4235 4240 |
| Glu Ser Pro Ala Arg Gly Gly Thr Glu Pro Lys Lys Gly Glu Ala Glu<br>4245 | 4250 | 4255      |
| Gly Pro Gly Gly Lys Glu Lys Gly Leu Glu Gly Lys Ser Pro Asp Thr<br>4260 | 4265 | 4270      |
| Gly Pro Asp Trp Leu Lys Gln Phe Asp Ala Val Leu Ala Gly Tyr Thr<br>4275 | 4280 | 4285      |
| Leu Lys Arg Gln Leu Asp Ile Leu Ser Leu Leu Lys Gln Glu Ser Pro<br>4290 | 4295 | 4300      |
| Ala Pro Glu Pro Pro Thr Gln His Arg Tyr Thr Tyr Asn Val Ser Asn         |      |           |

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| Leu Asp Val Arg Gln Leu Ser Ala Pro Pro Pro Glu Glu Pro Ser Pro |      |      |  |      |  |      |
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| Pro Pro Ser Pro Leu Ala Pro Ser Pro Ala Ser Pro Pro Thr Glu Pro |      |      |  |      |  |      |
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| Leu Val Glu Leu Pro Thr Glu Pro Leu Ala Glu Pro Pro Val Pro Ser |      |      |  |      |  |      |
|   | 4355 |      |  | 4360 |  | 4365 |
| Pro Leu Pro Leu Ala Ser Ser Pro Glu Ser Ala Arg Pro Lys Pro Arg |      |      |  |      |  |      |
|   | 4370 |      |  | 4375 |  | 4380 |
| Ala Arg Pro Pro Glu Glu Gly Glu Asp Thr Arg Pro Pro Arg Leu Lys |      |      |  |      |  |      |
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|   |      |      |  |      |  | 4400 |
| Lys Trp Lys Gly Val Arg Trp Lys Arg Arg Leu Arg Gly Ala Met Leu |      |      |  |      |  |      |
|   | 4405 |      |  | 4410 |  | 4415 |
| Glu Leu Phe Gly Val Asn Ser Leu Glu Val Lys Phe Arg Thr Arg Ser |      |      |  |      |  |      |
|   | 4420 |      |  | 4425 |  | 4430 |
| Glu Asn Gly Val Leu Ile His Ile Gln Glu Ser Ser Asn Tyr Thr Thr |      |      |  |      |  |      |
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| Val Lys Ile Lys Asn Gly Lys Val Tyr Phe Thr Ser Asp Ala Gly Ile |      |      |  |      |  |      |
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| Ala Gly Lys Val Glu Arg Asn Ile Pro Glu Val Tyr Val Ala Asp Gly |      |      |  |      |  |      |
|   | 4465 |      |  | 4470 |  | 4475 |
|   |      |      |  |      |  | 4480 |
| His Trp His Thr Phe Leu Ile Gly Lys Asn Gly Thr Ala Thr Val Leu |      |      |  |      |  |      |
|   | 4485 |      |  | 4490 |  | 4495 |
| Ser Val Asp Arg Ile Tyr Asn Arg Asp Ile Ile His Pro Thr Gln Asp |      |      |  |      |  |      |
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| Phe Gly Gly Leu Asp Val Leu Thr Ile Ser Leu Gly Gly Ile Pro Pro |      |      |  |      |  |      |
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| Asn Gln Ala His Arg Asp Ala Gln Thr Ala Gly Phe Asp Gly Cys Ile |      |      |  |      |  |      |
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| Ala Ser Met Trp Tyr Gly Gly Glu Ser Leu Pro Phe Ser Gly Lys His |      |      |  |      |  |      |
|   | 4545 |      |  | 4550 |  | 4555 |
|   |      |      |  |      |  | 4560 |
| Ser Leu Ala Ser Ile Ser Lys Thr Asp Pro Ser Val Lys Ile Gly Cys |      |      |  |      |  |      |
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| Arg Gly Pro Asn Ile Cys Ala Ser Asn Pro Cys Trp Gly Asp Leu Leu |      |      |  |      |  |      |
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| Cys Ile Asn Gln Trp Tyr Ala Tyr Arg Cys Val Pro Pro Gly Asp Cys |      |      |  |      |  |      |
|   | 4595 |      |  | 4600 |  | 4605 |
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| Glu Met Val Val Ala Cys Leu Gly Val Leu Cys Pro Gln Gly Lys Val |      |           |
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| Cys Lys Ala Gly Ser Pro Ala Gly His Val Cys Val Leu Ser Gln Gly |      |           |
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| Pro Glu Glu Ile Ser Leu Pro Leu Trp Ala Val Pro Ala Ile Val Gly |      |           |
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| Ser Cys Ala Thr Val Leu Ala Leu Leu Val Leu Ser Leu Ile Leu Cys |      |           |
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| Pro Lys Glu Lys Lys Lys Lys Gly Ser Glu Asn Val Ala Phe Asp Asp |      |           |
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| Pro Asp Asn Ile Pro Pro Tyr Gly Asp Asp Met Thr Val Arg Lys Gln |      |           |
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| Pro Glu Gly Asn Pro Lys Pro Asp Ile Ile Glu Arg Glu Asn Pro Tyr |      |           |
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| Leu Ile Tyr Asp Glu Thr Asp Ile Pro His Asn Ser Glu Thr Ile Pro |      |           |
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| Ser Ala Pro Leu Ala Ser Pro Glu Gln Glu Ile Glu His Tyr Asp Ile |      |           |
| 4785  | 4790 | 4795 4800 |
| Asp Asn Ala Ser Ser Ile Ala Pro Ser Asp Ala Asp Ile Ile Gln His |      |           |
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| Tyr Lys Gln Phe Arg Ser His Thr Pro Lys Phe Ser Ile Gln Arg His |      |           |
|   | 4820 | 4825 4830 |
| Ser Pro Leu Gly Phe Ala Arg Gln Ser Pro Met Pro Leu Gly Ala Ser |      |           |
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| Ser Leu Thr Tyr Gln Pro Ser Tyr Gly Gln Gly Leu Arg Thr Ser Ser |      |           |
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| Leu Ser His Ser Ala Cys Pro Thr Pro Asn Pro Leu Ser Arg His Ser |      |           |
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| Pro Ala Pro Phe Ser Lys Ser Ser Thr Phe Tyr Arg Asn Ser Pro Ala |      |           |
|   | 4885 | 4890 4895 |
| Arg Glu Leu His Leu Pro Ile Arg Asp Gly Asn Thr Leu Glu Met His |      |           |
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| Gly Asp Thr Cys Gln Pro Gly Ile Phe Asn Tyr Ala Thr Arg Leu Gly |      |           |

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 Tyr Thr Ser Arg Met Pro Lys Leu Ser Gln Val Asn Glu Ser Asp Ala  
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 Asp Asp Glu Asp Asn Tyr Gly Ala Leu Arg Lys Pro Arg Arg Tyr His  
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 Gly Thr Ala Asp Asn Thr Leu Pro Met Lys Leu Gly Gln Gln Ala Gly  
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 Tyr Val Asp Val Phe Lys Asp Leu Ala Ser Leu Pro Glu Lys Ala Ala  
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Asp Leu Ala Leu Ala Pro Ala Ser Ser Ala Gly Pro Gly Pro Gly Leu
      35                      40                      45

Ser Leu Gly Pro Gly Pro Ser Phe Gly Phe Ser Pro Gly Pro Thr Pro
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Thr Pro Glu Pro Thr Thr Ser Gly Leu Ala Gly Gly Ala Ala Ser His
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Gly Pro Ser Pro Phe Pro Arg Pro Trp Ala Pro His Ala Leu Pro Phe
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|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| Trp | Asp | Thr | Pro | Leu | Asn | His | Gly | Leu | Asn | Val | Phe | Val | Gly | Ala | Ala |  |  |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |  |  |
| Leu | Cys | Ile | Thr | Met | Leu | Gly | Leu | Gly | Cys | Thr | Val | Asp | Val | Asn | His |  |  |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |  |  |
| Phe | Gly | Ala | His | Val | Arg | Arg | Pro | Val | Gly | Ala | Leu | Leu | Ala | Ala | Leu |  |  |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |  |  |
| Cys | Gln | Phe | Gly | Leu | Leu | Pro | Leu | Leu | Ala | Phe | Leu | Leu | Ala | Leu | Ala |  |  |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |  |  |
| Phe | Lys | Leu | Asp | Glu | Val | Ala | Ala | Val | Ala | Val | Leu | Leu | Cys | Gly | Cys |  |  |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |  |  |
| Cys | Pro | Gly | Gly | Asn | Leu | Ser | Asn | Leu | Met | Ser | Leu | Leu | Val | Asp | Gly |  |  |
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| Asp | Met | Asn | Leu | Ser | Ile | Ile | Met | Thr | Ile | Ser | Ser | Thr | Leu | Leu | Ala |  |  |
|     | 195 |     |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |  |  |
| Leu | Val | Leu | Met | Pro | Leu | Cys | Leu | Trp | Ile | Tyr | Ser | Trp | Ala | Trp | Ile |  |  |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |  |  |
| Asn | Thr | Pro | Ile | Val | Gln | Leu | Leu | Pro | Leu | Gly | Thr | Val | Thr | Leu | Thr |  |  |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |  |  |
| Leu | Cys | Ser | Thr | Leu | Ile | Pro | Ile | Gly | Leu | Gly | Val | Phe | Ile | Arg | Tyr |  |  |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |  |  |
| Lys | Tyr | Ser | Arg | Val | Ala | Asp | Tyr | Ile | Val | Lys | Val | Arg | Pro | Val | Ser |  |  |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |  |  |
| Leu | Trp | Ser | Leu | Leu | Val | Thr | Leu | Val | Val | Leu | Phe | Ile | Met | Thr | Gly |  |  |
|     | 275 |     |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |  |  |
| Thr | Met | Leu | Gly | Pro | Glu | Leu | Leu | Ala | Ser | Ile | Pro | Ala | Ala | Val | Tyr |  |  |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |  |  |
| Val | Ile | Ala | Ile | Phe | Met | Pro | Leu | Ala | Gly | Tyr | Ala | Ser | Gly | Tyr | Gly |  |  |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |  |  |
| Leu | Ala | Thr | Leu | Phe | His | Leu | Pro | Pro | Asn | Cys | Lys | Arg | Thr | Val | Cys |  |  |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |  |  |
| Leu | Glu | Thr | Gly | Ser | Gln | Asn | Val | Gln | Leu | Cys | Thr | Ala | Ile | Leu | Lys |  |  |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |  |  |
| Leu | Ala | Phe | Pro | Pro | Gln | Phe | Ile | Gly | Ser | Met | Tyr | Met | Phe | Pro | Leu |  |  |
|     | 355 |     |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |  |  |
| Leu | Tyr | Ala | Leu | Phe | Gln | Ser | Ala | Glu | Ala | Gly | Ile | Phe | Val | Leu | Ile |  |  |
|     | 370 |     |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |  |  |
| Tyr | Lys | Met | Tyr | Gly | Ser | Glu | Met | Leu | His | Lys | Arg | Asp | Pro | Leu | Asp |  |  |
| 385 |     |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     | 400 |  |  |

Glu Asp Glu Asp Thr Asp Ile Ser Tyr Lys Lys Leu Lys Glu Glu Glu  
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 420 425 430

Met Glu Thr Ala Gln Thr Ser Leu  
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 Phe Arg Cys Ser Ser Ala Lys Ile Lys Ala Val Val Phe Gly Leu Leu  
           50                  55                  60  
 Pro Val Leu Ser Trp Leu Pro Lys Tyr Lys Ile Lys Asp Tyr Ile Ile  
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 Pro Asp Leu Leu Gly Gly Leu Ser Gly Gly Ser Ile Gln Val Pro Gln  
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 Gly Met Ala Phe Ala Leu Leu Ala Asn Leu Pro Ala Val Asn Gly Leu  
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 Tyr Ser Ser Phe Phe Pro Leu Leu Thr Tyr Phe Phe Leu Gly Gly Val  
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 Met Gly Leu Gly Phe Met Gln Phe Gly Phe Val Ala Ile Tyr Leu Ser  
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 Ile Ser Val Leu Lys Tyr Ile Phe Gly Leu Thr Ile Pro Ser Tyr Thr  
           225                  230                  235                  240  
 Gly Pro Gly Ser Ile Val Phe Val Ser Leu Gly Met Cys Lys Asn Leu  
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 Pro His Thr Asn Ile Ala Ser Leu Ile Phe Ala Leu Ile Ser Gly Ala  
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305 310 315 320  
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Phe Gly Ser Phe Phe Lys Ile His Val Ile Cys Cys Ala Leu Ser Val  
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Lys Val Arg Leu Ser Pro Trp Arg Pro Glu Ala Leu Asp Arg Glu Trp  
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 Pro Ala Asn Gly Thr Ser Val Ser Tyr Ile Thr Phe Ser Pro Asp Ser  
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 Ile Lys Ala Leu Ala Lys Leu Ser Ser Thr Tyr Gly Lys Ile Gly Val  
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 675 680 685  
 His Gly Gly Val Phe Glu Asp Gly Ser Leu Gly Cys Lys His Val Phe  
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<400> 118

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| Met | Gly | Val | Leu | Arg | Leu | Gly | Phe | Leu | Leu | Asp | Phe | Ile | Ser | Tyr | Pro |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Val | Ile | Lys | Gly | Phe | Thr | Ser | Ala | Ala | Ala | Val | Thr | Ile | Gly | Phe | Gly |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Gln | Ile | Lys | Asn | Leu | Leu | Gly | Leu | Gln | Asn | Ile | Pro | Arg | Pro | Phe | Phe |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Leu | Gln | Val | Tyr | His | Thr | Phe | Leu | Arg | Ile | Ala | Glu | Thr | Arg | Val | Gly |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Asp | Ala | Val | Leu | Gly | Leu | Val | Cys | Met | Leu | Leu | Leu | Leu | Val | Leu | Lys |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Leu | Met | Arg | Asp | His | Val | Pro | Pro | Val | His | Pro | Glu | Met | Pro | Pro | Gly |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Val | Arg | Leu | Ser | Arg | Gly | Leu | Val | Trp | Ala | Ala | Thr | Thr | Ala | Arg | Asn |
|     |     | 100 |     |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Ala | Leu | Val | Val | Ser | Phe | Ala | Ala | Leu | Val | Ala | Tyr | Ser | Phe | Glu | Val |
|     | 115 |     |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Thr | Gly | Tyr | Gln | Pro | Phe | Ile | Leu | Thr | Gly | Glu | Thr | Ala | Glu | Gly | Leu |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Pro | Pro | Val | Arg | Ile | Pro | Pro | Phe | Ser | Val | Thr | Thr | Ala | Asn | Gly | Thr |
| 145 |     |     |     | 150 |     |     |     |     |     | 155 |     |     |     | 160 |     |
| Ile | Ser | Phe | Thr | Glu | Met | Val | Gln | Asp | Met | Gly | Ala | Gly | Leu | Ala | Val |
|     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |     |
| Val | Pro | Leu | Met | Gly | Leu | Leu | Glu | Ser | Ile | Ala | Val | Ala | Lys | Ala | Phe |
|     |     | 180 |     |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Ala | Ser | Gln | Asn | Asn | Tyr | Arg | Ile | Asp | Ala | Asn | Gln | Glu | Leu | Leu | Ala |
|     | 195 |     |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Ile | Gly | Leu | Thr | Asn | Met | Leu | Gly | Ser | Leu | Val | Ser | Ser | Tyr | Pro | Val |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Thr | Gly | Ser | Phe | Gly | Arg | Thr | Ala | Val | Asn | Ala | Gln | Ser | Gly | Val | Cys |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 225 |     | 230 |     | 235 |     | 240 |     |     |     |     |     |     |     |     |     |
| Thr | Pro | Ala | Gly | Gly | Leu | Val | Thr | Gly | Val | Leu | Val | Leu | Leu | Ser | Leu |
|     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |     |
| Asp | Tyr | Leu | Thr | Ser | Leu | Phe | Tyr | Tyr | Ile | Pro | Lys | Ser | Ala | Leu | Ala |
|     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |     |
| Ala | Val | Ile | Ile | Met | Ala | Val | Ala | Pro | Leu | Phe | Asp | Thr | Lys | Ile | Phe |
|     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |     |
| Arg | Thr | Leu | Trp | Arg | Val | Lys | Arg | Leu | Asp | Leu | Leu | Pro | Leu | Cys | Val |
|     | 290 |     |     |     | 295 |     |     |     |     |     | 300 |     |     |     |     |
| Thr | Phe | Leu | Leu | Cys | Phe | Trp | Glu | Val | Gln | Tyr | Gly | Ile | Leu | Ala | Gly |
| 305 |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     |     | 320 |
| Ala | Leu | Val | Ser | Leu | Leu | Met | Leu | Leu | His | Ser | Ala | Ala | Arg | Pro | Glu |
|     |     |     | 325 |     |     |     |     |     | 330 |     |     |     |     | 335 |     |
| Thr | Lys | Val | Ser | Glu | Gly | Pro | Val | Leu | Val | Leu | Gln | Pro | Ala | Ser | Gly |
|     |     | 340 |     |     |     |     | 345 |     |     |     |     |     | 350 |     |     |
| Leu | Ser | Phe | Pro | Val | Leu | Cys | Pro | Pro | Leu | Pro | Ala | Val | Gln | Asp | Pro |
|     | 355 |     |     |     |     | 360 |     |     |     |     |     | 365 |     |     |     |
| Lys | Thr | Leu | Ser | Pro | Thr | Leu | Ser | Ser | Pro | Gln | Gly | Cys | Arg | His | Leu |
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<211> 2079

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<213> Homo sapiens

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<211> 692

<212> PRT

<213> Homo sapiens

<400> 120

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Val Asn Val Asn Leu Asn Thr Arg Glu Ser Ser Arg Lys Gly Ile Pro
      35             40             45

Ile Ser Trp Tyr Tyr Leu Ile Met Gly Val Leu Gly Leu Gly Phe Ile
  50             55             60

Ala Thr Tyr Leu Pro Glu Ser Ala Met Ser Ala Tyr Leu Ala Ala Val
  65             70             75             80

Ala Leu His Ile Met Leu Ser Gln Leu Thr Phe Ile Phe Gly Ile Met
      85             90             95

Ile Ser Phe His Ala Gly Pro Ile Ser Phe Phe Tyr Asp Ile Ile Asn
    100             105             110

Tyr Cys Val Ala Leu Pro Lys Ala Asn Ser Thr Ser Ile Leu Val Phe
    115             120             125

Leu Thr Val Val Val Ala Leu Arg Ile Asn Lys Cys Ile Arg Ile Ser
    130             135             140

Phe Asn Gln Tyr Pro Ile Glu Phe Pro Met Glu Leu Phe Leu Ile Ile
    145             150             155             160

Gly Phe Thr Val Ile Ala Asn Lys Ile Ser Met Ala Thr Glu Thr Ser
    165             170             175

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|   |     |     |     |
|---|-----|-----|-----|
| Gln Thr Leu Ile Asp Met Ile Pro Tyr Ser Phe Leu Leu Pro Val Thr | 180 | 185 | 190 |
| Pro Asp Phe Ser Leu Leu Pro Lys Ile Ile Leu Gln Ala Phe Ser Leu | 195 | 200 | 205 |
| Ser Leu Val Ser Ser Phe Leu Leu Ile Phe Leu Gly Lys Lys Ile Ala | 210 | 215 | 220 |
| Ser Leu His Asn Tyr Ser Val Asn Ser Asn Gln Asp Leu Ile Ala Ile | 225 | 230 | 235 |
| Gly Leu Cys Asn Val Val Ser Ser Phe Phe Arg Ser Cys Val Phe Thr | 245 | 250 | 255 |
| Gly Ala Ile Ala Arg Thr Ile Ile Gln Asp Lys Ser Gly Gly Arg Gln | 260 | 265 | 270 |
| Gln Phe Ala Ser Leu Val Gly Ala Gly Val Met Leu Leu Leu Met Val | 275 | 280 | 285 |
| Lys Met Gly His Phe Phe Tyr Thr Leu Pro Asn Val Asp Met Val Lys | 290 | 295 | 300 |
| Val Pro Leu Lys Glu Glu Glu Ile Phe Ser Leu Phe Asn Ser Ser Asp | 305 | 310 | 315 |
| Thr Asn Leu Gln Gly Gly Lys Ile Cys Arg Cys Phe Cys Asn Cys Asp | 325 | 330 | 335 |
| Asp Leu Glu Pro Leu Pro Arg Ile Leu Tyr Thr Glu Arg Phe Glu Asn | 340 | 345 | 350 |
| Lys Leu Asp Pro Glu Ala Ser Ser Ile Asn Leu Ile His Cys Ser His | 355 | 360 | 365 |
| Phe Glu Ser Met Asn Thr Ser Gln Thr Ala Ser Glu Asp Gln Val Pro | 370 | 375 | 380 |
| Tyr Thr Val Ser Ser Val Ser Gln Lys Asn Gln Gly Gln Gln Tyr Glu | 385 | 390 | 395 |
| Glu Val Glu Glu Val Trp Leu Pro Asn Asn Ser Ser Arg Asn Ser Ser | 405 | 410 | 415 |
| Pro Gly Leu Pro Asp Val Ala Glu Ser Gln Gly Arg Arg Ser Leu Ile | 420 | 425 | 430 |
| Pro Tyr Ser Asp Ala Ser Leu Leu Pro Ser Val His Thr Ile Ile Leu | 435 | 440 | 445 |
| Asp Phe Ser Met Val His Tyr Val Asp Ser Arg Gly Leu Val Val Leu | 450 | 455 | 460 |
| Arg Gln Ile Cys Asn Ala Phe Gln Asn Ala Asn Ile Leu Ile Leu Ile | 465 | 470 | 475 |
|   |     |     | 480 |

Ala Gly Cys His Ser Ser Ile Val Arg Ala Phe Glu Arg Asn Asp Phe  
485 490 495

Phe Asp Ala Gly Ile Thr Lys Thr Gln Leu Phe Leu Ser Val His Asp  
500 505 510

Ala Val Leu Phe Ala Leu Ser Arg Lys Val Ile Gly Ser Ser Glu Leu  
515 520 525

Ser Ile Asp Glu Ser Glu Thr Val Ile Arg Glu Thr Tyr Ser Glu Thr  
530 535 540

Asp Lys Asn Asp Asn Ser Arg Tyr Lys Met Ser Ser Ser Phe Leu Gly  
545 550 555 560

Ser Gln Lys Asn Val Ser Pro Gly Phe Ile Lys Ile Gln Gln Pro Val  
565 570 575

Glu Glu Glu Ser Glu Leu Asp Leu Glu Leu Glu Ser Glu Gln Glu Ala  
580 585 590

Gly Leu Gly Leu Asp Leu Asp Leu Asp Arg Glu Leu Glu Pro Glu Met  
595 600 605

Glu Pro Lys Ala Glu Thr Glu Thr Lys Thr Gln Thr Glu Met Glu Pro  
610 615 620

Gln Pro Glu Thr Glu Pro Glu Met Glu Pro Asn Pro Lys Ser Arg Pro  
625 630 635 640

Arg Ala His Thr Phe Pro Gln Gln Arg Tyr Trp Pro Met Tyr His Pro  
645 650 655

Ser Met Ala Ser Thr Gln Ser Gln Thr Gln Thr Arg Thr Trp Ser Val  
660 665 670

Glu Arg Arg Arg His Pro Met Asp Ser Tyr Ser Pro Glu Gly Asn Ser  
675 680 685

Asn Glu Asp Val  
690

<210> 121

<211> 2210

<212> DNA

<213> Homo sapiens

<400> 121

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ggtgctgcgg gcgcagcgtg gggccggggc cggggctgcc gagccgggac cccgcgcac 180  
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ccgcctgccc gagcgctgga acccgctgtg caaagagaag aaatatgatt atgataattt 420

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<210> 122

<211> 581

<212> PRT

<213> Homo sapiens

<400> 122

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Gly Arg Glu Ala Leu Leu Val Leu Leu Ala Leu Leu Ala Leu Ala Gly
      20             25             30

Leu Gly Ser Val Leu Arg Ala Gln Arg Gly Ala Gly Ala Gly Ala Ala
      35             40             45

Glu Pro Gly Pro Pro Arg Thr Pro Arg Pro Gly Arg Arg Glu Pro Val
      50             55             60

Met Pro Arg Pro Pro Val Pro Ala Asn Ala Leu Gly Ala Arg Gly Glu
      65             70             75             80

Ala Val Arg Leu Gln Leu Gln Gly Glu Glu Leu Arg Leu Gln Glu Glu
      85             90             95

Ser Val Arg Leu His Gln Ile Asn Ile Tyr Leu Ser Asp Arg Ile Ser

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| 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | His | Arg | Arg | Leu | Pro | Glu | Arg | Trp | Asn | Pro | Leu | Cys | Lys | Glu | Lys |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Lys | Tyr | Asp | Tyr | Asp | Asn | Leu | Pro | Arg | Thr | Ser | Val | Ile | Ile | Ala | Phe |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Tyr | Asn | Glu | Ala | Trp | Ser | Thr | Leu | Leu | Arg | Thr | Val | Tyr | Ser | Val | Leu |
| 145 |     |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     | 160 |
| Glu | Thr | Ser | Pro | Asp | Ile | Leu | Leu | Glu | Glu | Val | Ile | Leu | Val | Asp | Asp |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Tyr | Ser | Asp | Arg | Glu | His | Leu | Lys | Glu | Arg | Leu | Ala | Asn | Glu | Leu | Ser |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Gly | Leu | Pro | Lys | Val | Arg | Leu | Ile | Arg | Ala | Asn | Lys | Arg | Glu | Gly | Leu |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Val | Arg | Ala | Arg | Leu | Leu | Gly | Ala | Ser | Ala | Ala | Arg | Gly | Asp | Val | Leu |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Thr | Phe | Leu | Asp | Cys | His | Cys | Glu | Cys | His | Glu | Gly | Trp | Leu | Glu | Pro |
| 225 |     |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     | 240 |
| Leu | Leu | Gln | Arg | Ile | His | Glu | Glu | Glu | Ser | Ala | Val | Val | Cys | Pro | Val |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Ile | Asp | Val | Ile | Asp | Trp | Asn | Thr | Phe | Glu | Tyr | Leu | Gly | Asn | Ser | Gly |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Glu | Pro | Gln | Ile | Gly | Gly | Phe | Asp | Trp | Arg | Leu | Val | Phe | Thr | Trp | His |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Thr | Val | Pro | Glu | Arg | Glu | Arg | Ile | Arg | Met | Gln | Ser | Pro | Val | Asp | Val |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |
| Ile | Arg | Ser | Pro | Thr | Met | Ala | Gly | Gly | Leu | Phe | Ala | Val | Ser | Lys | Lys |
| 305 |     |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     | 320 |
| Tyr | Phe | Glu | Tyr | Leu | Gly | Ser | Tyr | Asp | Thr | Gly | Met | Glu | Val | Trp | Gly |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |
| Gly | Glu | Asn | Leu | Glu | Phe | Ser | Phe | Arg | Ile | Trp | Gln | Cys | Gly | Gly | Val |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |
| Leu | Glu | Thr | His | Pro | Cys | Ser | His | Val | Gly | His | Val | Phe | Pro | Lys | Gln |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |
| Ala | Pro | Tyr | Ser | Arg | Asn | Lys | Ala | Leu | Ala | Asn | Ser | Val | Arg | Ala | Ala |
|     | 370 |     |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |
| Glu | Val | Trp | Met | Asp | Glu | Phe | Lys | Glu | Leu | Tyr | Tyr | His | Arg | Asn | Pro |
| 385 |     |     |     |     |     | 390 |     |     |     |     | 395 |     |     |     | 400 |
| Arg | Ala | Arg | Leu | Glu | Pro | Phe | Gly | Asp | Val | Thr | Glu | Arg | Lys | Gln | Leu |

|   |                                 |     |
|---|---------------------------------|-----|
| 405   | 410                             | 415 |
| Arg Asp Lys Leu Gln Cys Lys Asp                                 | Phe Lys Trp Phe Leu Glu Thr Val |     |
| 420   | 425                             | 430 |
| Tyr Pro Glu Leu His Val Pro Glu Asp Arg Pro Gly Phe Phe Gly Met |                                 |     |
| 435   | 440                             | 445 |
| Leu Gln Asn Lys Gly Leu Thr Asp Tyr Cys Phe Asp Tyr Asn Pro Pro |                                 |     |
| 450   | 455                             | 460 |
| Asp Glu Asn Gln Ile Val Gly His Gln Val Ile Leu Tyr Leu Cys His |                                 |     |
| 465   | 470                             | 475 |
| Gly Met Gly Gln Asn Gln Phe Phe Glu Tyr Thr Ser Gln Lys Glu Ile |                                 |     |
| 485   | 490                             | 495 |
| Arg Tyr Asn Thr His Gln Pro Glu Gly Cys Ile Ala Val Glu Ala Gly |                                 |     |
| 500   | 505                             | 510 |
| Met Asp Thr Leu Ile Met His Leu Cys Glu Glu Thr Ala Pro Glu Asn |                                 |     |
| 515   | 520                             | 525 |
| Gln Lys Phe Ile Leu Gln Glu Asp Gly Ser Leu Phe His Glu Gln Ser |                                 |     |
| 530   | 535                             | 540 |
| Lys Lys Cys Val Gln Ala Ala Arg Lys Glu Ser Ser Asp Ser Phe Val |                                 |     |
| 545   | 550                             | 555 |
| Pro Leu Leu Arg Asp Cys Thr Asn Ser Asp His Gln Lys Trp Phe Phe |                                 |     |
| 565   | 570                             | 575 |
| Lys Glu Arg Met Leu   |                                 |     |
| 580   |                                 |     |

<210> 123

<211> 2030

<212> DNA

<213> Homo sapiens

<400> 123

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<210> 124  
 <211> 533  
 <212> PRT  
 <213> Homo sapiens

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<400> 124
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      20              25              30

Glu Ser His Gly Ser Leu Gly Ala Gln Ala Ser Pro Ala Ser Ala Ala
      35              40              45

Ala Ala Glu Gly Ser Ala Thr Arg Arg Ala Arg Ala Ala Thr Ser Arg
      50              55              60

Ala Ala Arg Ser Arg Arg Gln Pro Gly Pro Gly Ala Asp His Pro Gln
      65              70              75              80

Ala Gly Ala Pro Gly Gly Lys Arg Ala Ala Arg Lys Trp Arg Cys Ala
      85              90              95

Gly Gln Val Thr Ile Gln Gly Pro Ala Pro Pro Arg Pro Arg Ala Gly
      100             105             110

Arg Arg Asp Glu Ala Gly Gly Ala Arg Ala Ala Pro Leu Leu Leu Pro
      115             120             125

Pro Pro Pro Ala Ala Met Glu Thr Gly Lys Asp Gly Ala Arg Arg Gly
      130             135             140

Thr Gln Ser Pro Glu Arg Lys Arg Arg Ser Pro Val Pro Arg Ala Pro
      145             150             155             160

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Ser Thr Lys Leu Arg Pro Ala Ala Ala Ala Arg Ala Met Asp Pro Val  
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 180 185 190  
 Gly Gly Gly Gly Ser Ala Arg Pro Arg Tyr Ser Leu Leu Ala Glu Ile  
 195 200 205  
 Gly Arg Gly Ser Tyr Gly Val Val Tyr Glu Ala Val Ala Gly Arg Ser  
 210 215 220  
 Gly Ala Arg Val Ala Val Lys Lys Ile Arg Cys Asp Ala Pro Glu Asn  
 225 230 235 240  
 Val Glu Leu Ala Leu Ala Glu Phe Trp Ala Leu Thr Ser Leu Lys Arg  
 245 250 255  
 Arg His Gln Asn Val Val Gln Phe Glu Glu Cys Val Leu Gln Arg Asn  
 260 265 270  
 Gly Leu Ala Gln Arg Met Ser His Gly Asn Lys Ser Ser Gln Leu Tyr  
 275 280 285  
 Leu Arg Leu Val Glu Thr Ser Leu Lys Glu Arg Ile Leu Gly Tyr Ala  
 290 295 300  
 Glu Glu Pro Cys Tyr Leu Trp Phe Val Met Glu Phe Cys Glu Gly Gly  
 305 310 315 320  
 Asp Leu Asn Gln Tyr Val Leu Ser Arg Arg Pro Asp Pro Ala Thr Asn  
 325 330 335  
 Lys Ser Phe Met Leu Gln Leu Thr Ser Ala Ile Ala Phe Leu His Lys  
 340 345 350  
 Asn His Ile Val His Arg Asp Leu Lys Pro Asp Asn Ile Leu Ile Thr  
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 Glu Arg Ser Gly Thr Pro Ile Leu Lys Val Ala Asp Phe Gly Leu Ser  
 370 375 380  
 Lys Val Cys Ala Gly Leu Ala Pro Arg Gly Lys Glu Gly Asn Gln Asp  
 385 390 395 400  
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 405 410 415  
 Ser Asp Phe Tyr Met Ala Pro Glu Val Trp Glu Gly His Tyr Thr Ala  
 420 425 430  
 Lys Ala Asp Ile Phe Ala Leu Gly Ile Ile Ile Trp Ala Met Ile Glu  
 435 440 445  
 Arg Ile Thr Phe Ile Asp Ser Glu Thr Lys Lys Glu Leu Leu Gly Thr  
 450 455 460

Tyr Ile Lys Gln Gly Thr Glu Ile Val Pro Val Gly Glu Ala Leu Leu  
 465 470 475 480  
 Glu Asn Pro Lys Met Glu Leu His Ile Pro Gln Lys Arg Arg Thr Ser  
 485 490 495  
 Met Ser Glu Gly Ile Lys Gln Leu Leu Lys Asp Met Leu Ala Ala Asn  
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 Pro Gln Asp Arg Pro Asp Ala Phe Glu Leu Glu Thr Arg Met Asp Gln  
 515 520 525  
 Val Thr Cys Ala Ala  
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<210> 125  
 <211> 3331  
 <212> DNA  
 <213> Homo sapiens

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| Thr Gly Gln Ser Ile Val Gly Cys Lys Ala Ile Leu Ile Asp Asp Gln |  |     |  |     |  |     |
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|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Thr | Gly | Pro | Ser | Pro | Asp | Gly | Pro | Ser | Asp | Thr | Glu | Ser | Lys | Glu | Leu |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Gly | Val | Pro | Lys | Asp | Pro | Leu | Leu | Phe | Ile | Gln | Leu | Asn | Glu | Leu | Leu |
|     |     | 50  |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
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| 65  |     |     |     |     | 70  |     |     |     | 75  |     |     |     |     | 80  |     |
| Phe | Glu | Glu | Lys | Leu | Glu | Val | Ala | Ala | Gly | Arg | Trp | Ser | Ala | Pro | His |
|     |     |     | 85  |     |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Val | Pro | Thr | Leu | Ala | Leu | Pro | Ser | Leu | Gln | Lys | Leu | Arg | Ser | Leu | Leu |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Ala | Glu | Gly | Leu | Val | Leu | Leu | Asp | Cys | Pro | Ala | Gln | Ser | Leu | Leu | Glu |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Leu | Val | Glu | Gln | Val | Thr | Arg | Val | Glu | Ser | Leu | Ser | Pro | Glu | Leu | Arg |
|     |     | 130 |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Gly | Gln | Leu | Gln | Ala | Leu | Leu | Gln | Arg | Pro | Gln | His | Tyr | Asn | Gln |     |
| 145 |     |     |     |     | 150 |     |     |     | 155 |     |     |     |     | 160 |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Thr | Thr | Gly | Thr | Arg | Pro | Cys | Trp | Gly | Glu | Ser | Pro | Ser | Arg | Lys | Ala |  |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |  |
| Ser | Asp | Asn | Glu | Glu | Ala | Pro | Leu | Arg | Asp | Gln | Cys | Gln | Asn | Pro | Leu |  |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |  |
| Arg | Gln | Lys | Leu | Pro | Pro | Gly | Ala | Glu | Ala | Gly | Thr | Val | Leu | Ala | Gly |  |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |  |
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|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |  |
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| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |  |
| Phe | Phe | Cys | Leu | Leu | Leu | Gly | Pro | Cys | Met | Leu | Gly | Lys | Gly | Tyr | His |  |
|     |     |     | 245 |     |     |     |     |     | 250 |     |     |     |     | 255 |     |  |
| Glu | Met | Gly | Arg | Ala | Ala | Ala | Val | Leu | Leu | Ser | Asp | Pro | His | Ser | Gln |  |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |  |
| Gln | Phe | Gln | Trp | Ser | Val | Arg | Arg | Ala | Ser | Asn | Leu | His | Asp | Leu | Leu |  |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |  |
| Ala | Ala | Leu | Asp | Ala | Phe | Leu | Glu | Glu | Val | Thr | Val | Leu | Pro | Pro | Gly |  |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |  |
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|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |  |
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| Ile | Gln | Asp | Val | Arg | Arg | Lys | Val | Pro | Trp | Tyr | Pro | Ser | Asp | Phe | Leu |  |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |  |
| Asp | Ala | Leu | His | Leu | Gln | Cys | Phe | Ser | Ala | Val | Leu | Tyr | Ile | Tyr | Leu |  |
|     | 370 |     |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |  |
| Ala | Thr | Val | Thr | Asn | Ala | Ile | Thr | Phe | Gly | Gly | Leu | Leu | Gly | Asp | Ala |  |
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| Thr | Asp | Gly | Ala | Gln | Gly | Val | Leu | Glu | Ser | Phe | Leu | Gly | Thr | Ala | Val |  |
|     |     |     |     | 405 |     |     |     |     | 410 |     |     |     |     | 415 |     |  |
| Ala | Gly | Ala | Ala | Phe | Cys | Leu | Met | Ala | Gly | Gln | Pro | Leu | Thr | Ile | Leu |  |
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| Ser | Ser | Thr | Gly | Pro | Val | Leu | Val | Phe | Glu | Arg | Leu | Leu | Phe | Ser | Phe |  |
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 ggtgcctttg tgggtggaata ccacggggac ctcatcgaga tcaccgacgc caagaaacgg 780  
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1083

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<210> 130
<211> 345
<212> PRT
<213> Homo sapiens

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      20             25            30

Arg Gly Cys Gly Ala Arg Cys His Gly Pro Gly Arg Ala Ala Gly Lys
      35             40            45

Lys Met Ser Lys Pro Arg Ala Leu Glu Ala Ala Ala Ala Ala Ala
      50             55            60

Thr Ala Pro Gly Leu Glu Met Val Glu Arg Arg Gly Pro Gly Arg Pro
      65             70            75            80

Arg Thr Asp Gly Glu Ser Val Phe Thr Gly Gln Ser Lys Ile Tyr Ser
      85             90            95

Tyr Met Ser Pro Asn Lys Cys Ser Gly Met Arg Phe Pro Leu Gln Glu
      100            105           110

Glu Asn Ser Val Thr His His Glu Val Lys Cys Gln Gly Lys Pro Leu
      115            120           125

Ala Gly Ile Tyr Arg Lys Arg Glu Glu Lys Arg Asn Thr Gly Asn Ala
      130            135           140

Val Gln Ser Ala Met Lys Ser Lys Lys Gln Lys Ile Lys Asp Ala Arg
      145            150           155           160

Arg Gly Pro Leu Gln Gly Lys Thr Gln Gln Asn His Lys Leu Thr Asp
      165            170           175

Phe Tyr Pro Val Arg Arg Arg Ser Arg Lys Ser Lys Ala Glu Leu Gln
      180            185           190

Ser Glu Glu Arg Lys Arg Ile Asp Glu Leu Ile Glu Ser Gly Lys Glu
      195            200           205

Glu Gly Met Lys Ile Asp Leu Ile Asp Gly Lys Gly Arg Gly Val Ile
      210            215           220

Ala Thr Lys His Phe Ser Arg Gly Ala Phe Val Val Glu Tyr His Gly
      225            230           235           240

```





|             |             |             |             |             |            |      |
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| tggaaagacca | gaattccaag  | ctgagcaagg  | aactgctgga  | agatcgtctg  | gccgagttct | 2880 |
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Cys Val Val Ile Asn Pro Tyr Lys Gln Leu Pro Ile Tyr Thr Glu Ala
      35              40              45

Ile Val Glu Met Tyr Arg Gly Lys Lys Arg His Glu Val Pro Pro His
      50              55              60

Val Tyr Ala Val Thr Glu Gly Ala Tyr Arg Ser Met Leu Gln Asp Arg
      65              70              75              80

Glu Asp Gln Ser Ile Leu Cys Thr Gly Glu Ser Gly Ala Gly Lys Thr
      85              90              95

Glu Asn Thr Lys Lys Val Ile Gln Tyr Leu Ala His Val Ala Ser Ser
      100             105             110

Pro Lys Gly Arg Lys Glu Pro Gly Val Pro Gly Glu Leu Glu Arg Gln
      115             120             125

Leu Leu Gln Ala Asn Pro Ile Leu Glu Ala Phe Gly Asn Ala Lys Thr
      130             135             140

Val Lys Asn Asp Asn Ser Ser Arg Phe Gly Lys Phe Ile Arg Ile Asn
      145             150             155             160

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|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Phe | Asp | Val | Ala | Gly | Tyr | Ile | Val | Gly | Ala | Asn | Ile | Glu | Thr | Cys | Leu | 165 | 170 | 175 |
| Leu | Glu | Lys | Ser | Arg | Ala | Ile | Arg | Gln | Ala | Lys | Asp | Glu | Cys | Ser | Phe | 180 | 185 | 190 |
| His | Ile | Phe | Tyr | Gln | Leu | Leu | Gly | Gly | Ala | Gly | Glu | His | Gly | Cys | Arg | 195 | 200 | 205 |
| Glu | Leu | Leu | Leu | Glu | Pro | Cys | Ser | His | Tyr | Arg | Phe | Leu | Thr | Asn | Gly | 210 | 215 | 220 |
| Pro | Ser | Ser | Ser | Pro | Gly | Gln | Glu | Arg | Glu | Leu | Phe | Gln | Glu | Thr | Leu | 225 | 230 | 235 |
| Glu | Ser | Leu | Arg | Val | Leu | Gly | Phe | Ser | His | Glu | Glu | Ile | Ile | Ser | Met | 245 | 250 | 255 |
| Leu | Arg | Met | Val | Ser | Ala | Val | Leu | Gln | Phe | Gly | Asn | Ile | Ala | Leu | Lys | 260 | 265 | 270 |
| Arg | Glu | Arg | Asn | Thr | Asp | Gln | Ala | Thr | Met | Pro | Asp | Asn | Thr | Ala | Ala | 275 | 280 | 285 |
| Gln | Lys | Leu | Cys | Arg | Leu | Leu | Gly | Leu | Gly | Val | Thr | Asp | Phe | Ser | Arg | 290 | 295 | 300 |
| Ala | Leu | Leu | Thr | Pro | Arg | Ile | Lys | Val | Gly | Arg | Asp | Tyr | Val | Gln | Lys | 305 | 310 | 315 |
| Ala | Gln | Thr | Lys | Glu | Gln | Ala | Asp | Phe | Ala | Leu | Glu | Ala | Leu | Ala | Lys | 325 | 330 | 335 |
| Ala | Thr | Tyr | Glu | Arg | Leu | Phe | Arg | Trp | Leu | Val | Leu | Arg | Leu | Asn | Arg | 340 | 345 | 350 |
| Ala | Leu | Asp | Arg | Ser | Pro | Arg | Gln | Gly | Ala | Ser | Phe | Leu | Gly | Ile | Leu | 355 | 360 | 365 |
| Asp | Ile | Ala | Gly | Phe | Glu | Ile | Phe | Gln | Leu | Asn | Ser | Phe | Glu | Gln | Leu | 370 | 375 | 380 |
| Cys | Ile | Asn | Tyr | Thr | Asn | Glu | Lys | Leu | Gln | Gln | Leu | Phe | Asn | His | Thr | 385 | 390 | 395 |
| Met | Phe | Val | Leu | Glu | Gln | Glu | Glu | Tyr | Gln | Arg | Glu | Gly | Ile | Pro | Trp | 405 | 410 | 415 |
| Thr | Phe | Leu | Asp | Phe | Gly | Leu | Asp | Leu | Gln | Pro | Cys | Ile | Asp | Leu | Ile | 420 | 425 | 430 |
| Glu | Arg | Pro | Ala | Asn | Pro | Pro | Gly | Leu | Leu | Ala | Leu | Leu | Asp | Glu | Glu | 435 | 440 | 445 |
| Cys | Trp | Phe | Pro | Lys | Ala | Thr | Asp | Lys | Ser | Phe | Val | Glu | Lys | Val | Ala | 450 | 455 | 460 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gln | Glu | Gln | Gly | Gly | His | Pro | Lys | Phe | Gln | Arg | Pro | Arg | His | Leu | Arg | 465 | 470 | 475 | 480 |
| Asp | Gln | Ala | Asp | Phe | Ser | Val | Leu | His | Tyr | Ala | Gly | Lys | Val | Asp | Tyr | 485 | 490 | 495 |     |
| Lys | Ala | Asn | Glu | Trp | Leu | Met | Lys | Asn | Met | Asp | Pro | Leu | Asn | Asp | Asn | 500 | 505 | 510 |     |
| Val | Ala | Ala | Leu | Leu | His | Gln | Ser | Thr | Asp | Arg | Leu | Thr | Ala | Glu | Ile | 515 | 520 | 525 |     |
| Trp | Lys | Asp | Val | Glu | Gly | Ile | Val | Gly | Leu | Glu | Gln | Val | Ser | Ser | Leu | 530 | 535 | 540 |     |
| Gly | Asp | Gly | Pro | Pro | Gly | Gly | Arg | Pro | Arg | Arg | Gly | Met | Phe | Arg | Thr | 545 | 550 | 555 | 560 |
| Val | Gly | Gln | Leu | Tyr | Lys | Glu | Ser | Leu | Ser | Arg | Leu | Met | Ala | Thr | Leu | 565 | 570 | 575 |     |
| Ser | Asn | Thr | Asn | Pro | Ser | Phe | Val | Arg | Cys | Ile | Val | Pro | Asn | His | Glu | 580 | 585 | 590 |     |
| Lys | Arg | Val | Gly | Lys | Leu | Glu | Pro | Arg | Leu | Val | Leu | Asp | Gln | Leu | Arg | 595 | 600 | 605 |     |
| Cys | Asn | Gly | Val | Leu | Glu | Gly | Ile | Arg | Ile | Cys | Arg | Gln | Gly | Phe | Pro | 610 | 615 | 620 |     |
| Asn | Arg | Ile | Leu | Phe | Gln | Glu | Phe | Arg | Gln | Arg | Tyr | Glu | Ile | Leu | Thr | 625 | 630 | 635 | 640 |
| Pro | Asn | Ala | Ile | Pro | Lys | Gly | Phe | Met | Asp | Gly | Lys | Gln | Ala | Cys | Glu | 645 | 650 | 655 |     |
| Lys | Met | Ile | Gln | Ala | Leu | Glu | Leu | Asp | Pro | Asn | Leu | Tyr | Arg | Val | Gly | 660 | 665 | 670 |     |
| Gln | Ser | Lys | Ile | Phe | Phe | Arg | Ala | Gly | Val | Leu | Ala | Gln | Leu | Glu | Glu | 675 | 680 | 685 |     |
| Glu | Arg | Asp | Leu | Lys | Val | Thr | Asp | Ile | Ile | Val | Ser | Phe | Gln | Ala | Ala | 690 | 695 | 700 |     |
| Ala | Arg | Gly | Tyr | Leu | Ala | Arg | Arg | Ala | Phe | Gln | Lys | Arg | Gln | Gln | Gln | 705 | 710 | 715 | 720 |
| Gln | Ser | Ala | Leu | Arg | Val | Met | Gln | Arg | Asn | Cys | Ala | Ala | Tyr | Leu | Lys | 725 | 730 | 735 |     |
| Leu | Arg | His | Trp | Gln | Trp | Trp | Arg | Leu | Phe | Thr | Lys | Val | Lys | Pro | Leu | 740 | 745 | 750 |     |
| Leu | Gln | Val | Thr | Arg | Gln | Asp | Glu | Val | Leu | Gln | Ala | Arg | Ala | Gln | Glu | 755 | 760 | 765 |     |

Leu Gln Lys Val Gln Glu Leu Gln Gln Gln Ser Ala Arg Glu Val Gly  
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 Thr Arg Gly Arg Leu Ala Ala Arg Lys Gln Glu Leu Glu Leu Val Val  
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 Ser Glu Leu Glu Ala Arg Val Gly Glu Glu Glu Glu Cys Ser Arg Gln  
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 Met Gln Thr Glu Lys Lys Arg Leu Gln Gln His Ile Gln Glu Leu Glu  
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 Ala His Leu Glu Ala Glu Glu Gly Ala Arg Gln Lys Leu Gln Leu Glu  
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 Lys Val Thr Thr Glu Ala Lys Met Lys Lys Phe Glu Glu Asp Leu Leu  
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 Leu Leu Glu Asp Gln Asn Ser Lys Leu Ser Lys Glu Leu Leu Glu Asp  
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 945 950 955 960  
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 Met Val Glu Gln Gln Gln Arg Ala Glu Glu Leu Arg Ala Gln Leu Gly  
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 995 1000 1005  
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 Phe Asp Gln Leu Leu Ala Glu Glu Lys Ala Ala Val Leu Arg Ala Val  
 1365 1370 1375

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 Leu Ser Ser Lys Asp Asp Val Gly Lys Ser Val His Glu Leu Glu Arg  
 1425 1430 1435 1440  
 Ala Cys Arg Val Ala Glu Gln Ala Ala Asn Asp Leu Arg Ala Gln Val  
 1445 1450 1455  
 Thr Glu Leu Glu Asp Glu Leu Thr Ala Ala Glu Asp Ala Lys Leu Arg  
 1460 1465 1470  
 Leu Glu Val Thr Val Gln Ala Leu Lys Thr Gln His Glu Arg Asp Leu  
 1475 1480 1485  
 Gln Gly Arg Asp Glu Ala Gly Glu Glu Arg Arg Arg Gln Leu Ala Lys  
 1490 1495 1500  
 Gln Leu Arg Asp Ala Glu Val Glu Arg Asp Glu Glu Arg Lys Gln Arg  
 1505 1510 1515 1520  
 Thr Leu Ala Val Ala Ala Arg Lys Lys Leu Glu Gly Glu Leu Glu Glu  
 1525 1530 1535  
 Leu Lys Ala Gln Met Ala Ser Ala Gly Gln Gly Lys Glu Glu Ala Val  
 1540 1545 1550  
 Lys Gln Leu Arg Lys Met Gln Ala Gln Met Lys Glu Leu Trp Arg Glu  
 1555 1560 1565  
 Val Glu Glu Thr Arg Thr Ser Arg Glu Glu Ile Phe Ser Gln Asn Arg  
 1570 1575 1580  
 Glu Ser Glu Lys Arg Leu Lys Gly Leu Glu Ala Glu Val Leu Arg Leu  
 1585 1590 1595 1600  
 Gln Glu Glu Leu Ala Ala Ser Asp Arg Ala Arg Arg Gln Ala Gln Gln  
 1605 1610 1615  
 Asp Arg Asp Glu Met Ala Asp Glu Val Ala Asn Gly Asn Leu Ser Lys  
 1620 1625 1630  
 Ala Ala Ile Leu Glu Glu Lys Arg Gln Leu Glu Gly Arg Leu Gly Gln  
 1635 1640 1645  
 Leu Glu Glu Glu Leu Glu Glu Glu Gln Thr Thr Gln Ser Cys Ser Met  
 1650 1655 1660  
 Thr Ala Thr Ala Ser Cys Ser Cys Arg  
 1665 1670



<210> 133  
 <211> 688  
 <212> DNA  
 <213> Homo sapiens

<400> 133  
 cccaaccacg gccaggcttg cgcgcggttc ccctcccggg gggcggtatc ctgggcaaga 60  
 tgaagtgggt gtgggcgctc ttgctgttgg cggcgctggg cagcgggccgc gcggagcgcg 120  
 actgccgagt gagcagcttc cgagtcaagg agaacttcga caaggctcgc ttctctggga 180  
 cctggtacgc catggccaag aaggaccccg agggcctctt tctgcaggac aacatcgctc 240  
 cggagttctc cgtggacgag accggccaga tgagcgccac agccaagggc cgagtcctgc 300  
 ttttgaataa ctgggacgtg tgcgcagaca tgggtgggcac cttcacagac accgaggacc 360  
 ctgccaagtt caagatgaag tactggggcg tagcctcctt tctccagaaa ggaaatgatg 420  
 accactggat cgtcgacaca gactacgaca cgtatgccgt gcagtactcc tgccgcctcc 480  
 tgaacctcga tggcacctgt gctgacagct actccttcgt gttttcccg gacccaacg 540  
 gcctgcccc agaagcgcag aagattgtaa ggcagcggca ggaggagctg tgctggcca 600  
 ggagtagcag gctgatcgtc cacaacggtt actgcatggg cagatcagaa agaaaccttt 660  
 tgtagcaagg gcgaattcca gcacactg 688

<210> 134  
 <211> 201  
 <212> PRT  
 <213> Homo sapiens

<400> 134  
 Met Lys Trp Val Trp Ala Leu Leu Leu Leu Ala Ala Leu Gly Ser Gly  
 1 5 10 15  
 Arg Ala Glu Arg Asp Cys Arg Val Ser Ser Phe Arg Val Lys Glu Asn  
 20 25 30  
 Phe Asp Lys Ala Arg Phe Ser Gly Thr Trp Tyr Ala Met Ala Lys Lys  
 35 40 45  
 Asp Pro Glu Gly Leu Phe Leu Gln Asp Asn Ile Val Ala Glu Phe Ser  
 50 55 60  
 Val Asp Glu Thr Gly Gln Met Ser Ala Thr Ala Lys Gly Arg Val Arg  
 65 70 75 80  
 Leu Leu Asn Asn Trp Asp Val Cys Ala Asp Met Val Gly Thr Phe Thr  
 85 90 95  
 Asp Thr Glu Asp Pro Ala Lys Phe Lys Met Lys Tyr Trp Gly Val Ala  
 100 105 110  
 Ser Phe Leu Gln Lys Gly Asn Asp Asp His Trp Ile Val Asp Thr Asp  
 115 120 125  
 Tyr Asp Thr Tyr Ala Val Gln Tyr Ser Cys Arg Leu Leu Asn Leu Asp  
 130 135 140  
 Gly Thr Cys Ala Asp Ser Tyr Ser Phe Val Phe Ser Arg Asp Pro Asn  
 145 150 155 160

Gly Leu Pro Pro Glu Ala Gln Lys Ile Val Arg Gln Arg Gln Glu Glu  
165 170 175

Leu Cys Leu Ala Arg Gln Tyr Arg Leu Ile Val His Asn Gly Tyr Cys  
180 185 190

Asp Gly Arg Ser Glu Arg Asn Leu Leu  
195 200

<210> 135  
<211> 1647  
<212> DNA  
<213> Homo sapiens

<400> 135  
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ctgagtgggc tgaacgagca gcggaacgag ggcctgctgt gcgacgtggt gatcctgggtg 120  
gagggccgcg agtccccac gcaccgctcg gtgctggccg cctgcagcca gtacttcaag 180  
aagctgttca cgtcggggcg cgtggtggac cagcagaacg tgtacgagat cgacttcgtc 240  
agcgccgagg cgctcacgcg gctcatggac ttgcctaca cggccacgct caccgtcagc 300  
acagccaacg tgggtgacat cctcagcgcc gcccgctgc tggagatccc cgccgtgagc 360  
cacgtgtgcg ccgacctcct ggaccggcag atcctggcgg ccgacgcggg cgccgacgcc 420  
gggcagctgg accttgtaga tcaaattgat cagcgcaacc tcctccgcgc caaggagtac 480  
ctcgagttct tccagagcaa ccccatgaac agcctgcccc ccgcgggccg cgccgccgct 540  
gccagcttcc cgtggtccgc ctttggggcg tccgatgatg acctggatgc caccaaggag 600  
gccgtggccg ccgctgtggc cgccgtggcc gcggggcgact gcaacggctt agacttctat 660  
gggcccggcc ccccggccga gcgcccccg acgggggacg gggacgaggg cgacagcaac 720  
ccgggtctgt ggccagagcg ggatgaggac gccccaccg ggggtctctt tccgccgcg 780  
gtggccccgc cggccgccac gcagaacggc cactacggcc gcggcgagga ggaggaggcc 840  
gcctcgctgt cggaggcggc ccccgagccg ggcgactctc cgggcttctt gtcgggagac 900  
agcgacgagg agtcgcgggc cgacgacaag ggcgtcatgg actactacct gaagtacttc 960  
agcgggcgccc acgacggcga cgtctaccgg gcctggctgc agaaggtgga gaagaagatc 1020  
cgagccaagg ccttccagaa gtgccccatc tgcgagaagg tcatccagg cgccggcaag 1080  
ctgccgcgac acatccgcac ccacacgggc gagaagccct acgagtgcaa catctgcaag 1140  
gtccgcttca ccaggcagga caagctgaag gtgcacatgc ggaagcacac gggcgagaag 1200  
ccgtacctgt gccagcagtg cggcgccgcc tttgcccaca actacgacct gaagaaccac 1260  
atgcgcgtgc acacgggcct gcgcccctac cagtgcgaca gctgctgcaa gaccttcgtc 1320  
cgctccgacc acctgcacag acacctcaag aaagacggct gcaacggcgt cccctcgcg 1380  
cgcgcccgca agccccgct ccggggcggg gcgcccagcc ccagcccggg ggccaccgcg 1440  
acccccggcg cccccgcca gccagctcc ccgacgccc ggcgcaacgg ccaggagaag 1500  
cactttaagg acgaggacga ggacgaggac gtggccagcc ccgacggctt gggccggtt 1560  
aatgtagcgg gcgccggtgg aggaggtgac agcggagggtg gccccggggc cgccaccgac 1620  
ggtaacttca cagccggact cgcctaa 1647

<210> 136  
<211> 548  
<212> PRT  
<213> Homo sapiens

<400> 136  
Met Ala Gly Gly Val Asp Gly Pro Ile Gly Ile Pro Phe Pro Asp His  
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Ser Ser Asp Ile Leu Ser Gly Leu Asn Glu Gln Arg Thr Gln Gly Leu  
20 25 30

Leu Cys Asp Val Val Ile Leu Val Glu Gly Arg Glu Phe Pro Thr His  
 35 40 45  
 Arg Ser Val Leu Ala Ala Cys Ser Gln Tyr Phe Lys Lys Leu Phe Thr  
 50 55 60  
 Ser Gly Ala Val Val Asp Gln Gln Asn Val Tyr Glu Ile Asp Phe Val  
 65 70 75 80  
 Ser Ala Glu Ala Leu Thr Ala Leu Met Asp Phe Ala Tyr Thr Ala Thr  
 85 90 95  
 Leu Thr Val Ser Thr Ala Asn Val Gly Asp Ile Leu Ser Ala Ala Arg  
 100 105 110  
 Leu Leu Glu Ile Pro Ala Val Ser His Val Cys Ala Asp Leu Leu Asp  
 115 120 125  
 Arg Gln Ile Leu Ala Ala Asp Ala Gly Ala Asp Ala Gly Gln Leu Asp  
 130 135 140  
 Leu Val Asp Gln Ile Asp Gln Arg Asn Leu Leu Arg Ala Lys Glu Tyr  
 145 150 155 160  
 Leu Glu Phe Phe Gln Ser Asn Pro Met Asn Ser Leu Pro Pro Ala Ala  
 165 170 175  
 Ala Ala Ala Ala Ala Ser Phe Pro Trp Ser Ala Phe Gly Ala Ser Asp  
 180 185 190  
 Asp Asp Leu Asp Ala Thr Lys Glu Ala Val Ala Ala Ala Val Ala Ala  
 195 200 205  
 Val Ala Ala Gly Asp Cys Asn Gly Leu Asp Phe Tyr Gly Pro Gly Pro  
 210 215 220  
 Pro Ala Glu Arg Pro Pro Thr Gly Asp Gly Asp Glu Gly Asp Ser Asn  
 225 230 235 240  
 Pro Gly Leu Trp Pro Glu Arg Asp Glu Asp Ala Pro Thr Gly Gly Leu  
 245 250 255  
 Phe Pro Pro Pro Val Ala Pro Pro Ala Ala Thr Gln Asn Gly His Tyr  
 260 265 270  
 Gly Arg Gly Gly Glu Glu Glu Ala Ala Ser Leu Ser Glu Ala Ala Pro  
 275 280 285  
 Glu Pro Gly Asp Ser Pro Gly Phe Leu Ser Gly Asp Ser Asp Glu Glu  
 290 295 300  
 Ser Arg Ala Asp Asp Lys Gly Val Met Asp Tyr Tyr Leu Lys Tyr Phe  
 305 310 315 320  
 Ser Gly Ala His Asp Gly Asp Val Tyr Pro Ala Trp Ser Gln Lys Val  
 325 330 335

Glu Lys Lys Ile Arg Ala Lys Ala Phe Gln Lys Cys Pro Ile Cys Glu  
 340 345 350  
 Lys Val Ile Gln Gly Ala Gly Lys Leu Pro Arg His Ile Arg Thr His  
 355 360 365  
 Thr Gly Glu Lys Pro Tyr Glu Cys Asn Ile Cys Lys Val Arg Phe Thr  
 370 375 380  
 Arg Gln Asp Lys Leu Lys Val His Met Arg Lys His Thr Gly Glu Lys  
 385 390 395 400  
 Pro Tyr Leu Cys Gln Gln Cys Gly Ala Ala Phe Ala His Asn Tyr Asp  
 405 410 415  
 Leu Lys Asn His Met Arg Val His Thr Gly Leu Arg Pro Tyr Gln Cys  
 420 425 430  
 Asp Ser Cys Cys Lys Thr Phe Val Arg Ser Asp His Leu His Arg His  
 435 440 445  
 Leu Lys Lys Asp Gly Cys Asn Gly Val Pro Ser Arg Arg Gly Arg Lys  
 450 455 460  
 Pro Arg Val Arg Gly Gly Ala Pro Asp Pro Ser Pro Gly Ala Thr Ala  
 465 470 475 480  
 Thr Pro Gly Ala Pro Ala Gln Pro Ser Ser Pro Asp Ala Arg Arg Asn  
 485 490 495  
 Gly Gln Glu Lys His Phe Lys Asp Glu Asp Glu Asp Glu Asp Val Ala  
 500 505 510  
 Ser Pro Asp Gly Leu Gly Arg Leu Asn Val Ala Gly Ala Gly Gly Gly  
 515 520 525  
 Gly Asp Ser Gly Gly Gly Pro Gly Ala Ala Thr Asp Gly Asn Phe Thr  
 530 535 540  
 Ala Gly Leu Ala  
 545

<210> 137

<211> 1026

<212> DNA

<213> Homo sapiens

<400> 137

gatcgaggct caggccctgg aaggaccgta aacatttggc cagcttggtt tggataacctg 60  
 gcagagacca ggttctgaga agcaatggtg acgaaggcct ttgtcttggt ggccatcttt 120  
 gcagaagcct ctgcaaaatc gtgtgctcca aataaagcag atgtcattct tgtgttttgc 180  
 tatcccaaaa ccatcatcac caaaatcccc gagtgtccct atggatggga agttcatcag 240  
 ctggccctcg gagggctgtg ttacaatggg gtccacgaag gaggttacta ccaatttctg 300  
 atcccagatt tatcacctaa aaacaagtcc tattgtggaa cccagtctga gtacaagcca 360  
 cctatctatc acttctacag tcacatcggt tccaatgaca ccacagtgat tgtaaaaaaac 420

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cagcctgtca actactcctt ctccctgcacc taccactcca cctacttggt gaaccaggct 480
gccttttgacc agagtgtcaa tttcctttcca aagaatgcc agttctccat caagaaagaa 540
gctccctttg tctggaggc atccgaaatc gggttcagatc tgtttgagg agtggaagcc 600
aaagggttaa gcattagggt taaagtggc ttgaacagct gttggggcac cccctcggct 660
gacttcatgt atcccttgca gtggcagctg atcaacaagg gctgccccac ggatgaaacc 720
gtcctcgtgc atgagaatgg gagagatcac agggcaacct tccaattcaa tgctttccgg 780
ttccagaaca tccccaaact ctccaagggtg tggttacact gtgagacgtt catctgcgac 840
agtgagaaac tctcctgccc agtgacctgc gataaacgga agcgctcct gcgagaccag 900
accgggggag tcttggtcgt ggagctctcc ctgcggaatg ttctccacca cctcatcatg 960
atgttgggga tttgtgccgt gttataggag tttagccaggc agctgccgct cctccacca 1020
caatag 1026

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<210> 138
<211> 300
<212> PRT
<213> Homo sapiens

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<400> 138
Met Val Thr Lys Ala Phe Val Leu Leu Ala Ile Phe Ala Glu Ala Ser
 1          5          10          15

Ala Lys Ser Cys Ala Pro Asn Lys Ala Asp Val Ile Leu Val Phe Cys
          20          25          30

Tyr Pro Lys Thr Ile Ile Thr Lys Ile Pro Glu Cys Pro Tyr Gly Trp
          35          40          45

Glu Val His Gln Leu Ala Leu Gly Gly Leu Cys Tyr Asn Gly Val His
          50          55          60

Glu Gly Gly Tyr Tyr Gln Phe Val Ile Pro Asp Leu Ser Pro Lys Asn
          65          70          75          80

Lys Ser Tyr Cys Gly Thr Gln Ser Glu Tyr Lys Pro Pro Ile Tyr His
          85          90          95

Phe Tyr Ser His Ile Val Ser Asn Asp Thr Thr Val Ile Val Lys Asn
          100          105          110

Gln Pro Val Asn Tyr Ser Phe Ser Cys Thr Tyr His Ser Thr Tyr Leu
          115          120          125

Val Asn Gln Ala Ala Phe Asp Gln Ser Val Asn Phe Leu Pro Lys Asn
          130          135          140

Ala Lys Phe Ser Ile Lys Lys Glu Ala Pro Phe Val Leu Glu Ala Ser
          145          150          155          160

Glu Ile Gly Ser Asp Leu Phe Ala Gly Val Glu Ala Lys Gly Leu Ser
          165          170          175

Ile Arg Phe Lys Val Val Leu Asn Ser Cys Trp Ala Thr Pro Ser Ala
          180          185          190

Asp Phe Met Tyr Pro Leu Gln Trp Gln Leu Ile Asn Lys Gly Cys Pro
          195          200          205

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Thr Asp Glu Thr Val Leu Val His Glu Asn Gly Arg Asp His Arg Ala  
 210 215 220  
 Thr Phe Gln Phe Asn Ala Phe Arg Phe Gln Asn Ile Pro Lys Leu Ser  
 225 230 235 240  
 Lys Val Trp Leu His Cys Glu Thr Phe Ile Cys Asp Ser Glu Lys Leu  
 245 250 255  
 Ser Cys Pro Val Thr Cys Asp Lys Arg Lys Arg Leu Leu Arg Asp Gln  
 260 265 270  
 Thr Gly Gly Val Leu Val Val Glu Leu Ser Leu Arg Asn Val Leu His  
 275 280 285  
 His Leu Ile Met Met Leu Gly Ile Cys Ala Val Leu  
 290 295 300

<210> 139  
 <211> 1012  
 <212> DNA  
 <213> Homo sapiens

<400> 139  
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 agaagcctct gcaaaatcgt gtgctccaaa taaagcagat gtcattcttg tgttttgcta 120  
 tccccaaacc atcatcacca aaatccccga gtgtccctat ggatgggaag ttcacagct 180  
 ggccctcgga gggctgtgtt acaatgggggt ccacgaagga gggtactacc aatttgatgat 240  
 cccagattta tcacctaaaa acaagtccta ttgtggaacc cagtctgagt acaagccacc 300  
 tatctatcac ttctacagtc acatcgtttc caatgacgcc acagtgattg taaaaaacca 360  
 gcctgtcaac tactccttct cctgcaccta ccactccacc tacttggtga accaggctgc 420  
 ctttgaccag agagtggcca ctgttcacgt gaagaacggg agcatgggca catttgagag 480  
 ccaactgtct ctcaacttct acactaatgc caagtctctc atcaagaaag aagctccctt 540  
 tgtcctggag gcatccgaaa tcggttcaga tctgtttgca ggagtgggaag ccaaagggtt 600  
 aagcattagg tttaaagtgg tcttgaacag ctgttggggc accccctcgg ctgacttcat 660  
 gtatcccttg cagtggcagc tgatcaacaa gggctgcccc acggatgaaa ccgtcctcgt 720  
 gcatgagaat gggagagatc acagggcaac cttccaattc aatgctttcc ggtccagaa 780  
 catccccaaa ctctccaagg tgtggttaca ctgtgagacg ttcactctgc acagtgagaa 840  
 actctcctgc ccagtgcctt gcgataaacg gaagcgcctc ctgcgagacc agaccggggg 900  
 agtcctggtc gtggagctct ccctgcggag caggggattt tccagtctct atagcttctc 960  
 agatgttctc caccacctca tcatgatgtt ggggatttgt gccgtgttat ag 1012

<210> 140  
 <211> 329  
 <212> PRT  
 <213> Homo sapiens

<400> 140  
 Met Val Thr Lys Ala Phe Val Leu Leu Ala Ile Phe Ala Glu Ala Ser  
 1 5 10 15  
 Ala Lys Ser Cys Ala Pro Asn Lys Ala Asp Val Ile Leu Val Phe Cys  
 20 25 30

Tyr Pro Lys Thr Ile Ile Thr Lys Ile Pro Glu Cys Pro Tyr Gly Trp  
 35 40 45  
 Glu Val His Gln Leu Ala Leu Gly Gly Leu Cys Tyr Asn Gly Val His  
 50 55 60  
 Glu Gly Gly Tyr Tyr Gln Phe Val Ile Pro Asp Leu Ser Pro Lys Asn  
 65 70 75 80  
 Lys Ser Tyr Cys Gly Thr Gln Ser Glu Tyr Lys Pro Pro Ile Tyr His  
 85 90 95  
 Phe Tyr Ser His Ile Val Ser Asn Asp Ala Thr Val Ile Val Lys Asn  
 100 105 110  
 Gln Pro Val Asn Tyr Ser Phe Ser Cys Thr Tyr His Ser Thr Tyr Leu  
 115 120 125  
 Val Asn Gln Ala Ala Phe Asp Gln Arg Val Ala Thr Val His Val Lys  
 130 135 140  
 Asn Gly Ser Met Gly Thr Phe Glu Ser Gln Leu Ser Leu Asn Phe Tyr  
 145 150 155 160  
 Thr Asn Ala Lys Phe Ser Ile Lys Lys Glu Ala Pro Phe Val Leu Glu  
 165 170 175  
 Ala Ser Glu Ile Gly Ser Asp Leu Phe Ala Gly Val Glu Ala Lys Gly  
 180 185 190  
 Leu Ser Ile Arg Phe Lys Val Val Leu Asn Ser Cys Trp Ala Thr Pro  
 195 200 205  
 Ser Ala Asp Phe Met Tyr Pro Leu Gln Trp Gln Leu Ile Asn Lys Gly  
 210 215 220  
 Cys Pro Thr Asp Glu Thr Val Leu Val His Glu Asn Gly Arg Asp His  
 225 230 235 240  
 Arg Ala Thr Phe Gln Phe Asn Ala Phe Arg Phe Gln Asn Ile Pro Lys  
 245 250 255  
 Leu Ser Lys Val Trp Leu His Cys Glu Thr Phe Ile Cys Asp Ser Glu  
 260 265 270  
 Lys Leu Ser Cys Pro Val Thr Cys Asp Lys Arg Lys Arg Leu Leu Arg  
 275 280 285  
 Asp Gln Thr Gly Gly Val Leu Val Val Glu Leu Ser Leu Arg Ser Arg  
 290 295 300  
 Gly Phe Ser Ser Leu Tyr Ser Phe Ser Asp Val Leu His His Leu Ile  
 305 310 315 320  
 Met Met Leu Gly Ile Cys Ala Val Leu  
 325

<210> 141  
 <211> 1012  
 <212> DNA  
 <213> Homo sapiens

<400> 141  
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 agaagcctct gcaaaatcgt gtgctccaaa taaagcagat gtcattcttg tgttttgcta 120  
 tcccaaaacc atcatcacca aaatccccga gtgtccctat ggatgggaag ttcacagct 180  
 ggccctcgga gggctgtgtt acaatggggt ccacgaagga ggttactacc aatttgatgat 240  
 cccagattta tcacctaaaa acaagtccta ttgtggaacc cagtctgagt acaagccacc 300  
 tatctatcac ttctacagtc acatcgtttc caatgacacc acagtgattg taaaaacca 360  
 gcctgtcaac tactccttct cctgcaccta ccactccacc tacttggtga accaggctgc 420  
 ctttgaccag agagtggcca ctgttcacgt gaagaacggg agcatgggca catttgagag 480  
 ccaactgtct ctcaacttct acactaatgc caagttctcc atcaagaaag aagctccctt 540  
 tgtcctggag gcatcggaat tcggttcaga tctgtttgca ggagtgggaag ccaaagggtt 600  
 aagcattagg tttaaagtgg tcttgaacag ctgttgggcc accccctcgg ctgacttcat 660  
 gtatcccttg cagtggcagc tgatcaacaa gggctgcccc acggatgaaa ccgtcctcgt 720  
 gcatgagaat gggagagatc acagggcaac cttccaattc aatgctttcc ggttccagaa 780  
 catccccaaa ctctccaagg tgtggttaca ctgtgagacg ttcacatgcg acagtgagaa 840  
 actctcctgc ccagtgcctt gcgataaacg gaagcgctc ctgcgagacc agaccggggg 900  
 agtcctgggc gtggagctct ccctgcggag caggggattt tccagtctct atagcttctc 960  
 agatgttctc caccacctca tcatgatgtt ggggatttgt gccgtgttat ag 1012

<210> 142  
 <211> 329  
 <212> PRT  
 <213> Homo sapiens

<400> 142  
 Met Val Thr Lys Ala Phe Val Leu Leu Ala Ile Phe Ala Glu Ala Ser  
 1 5 10 15  
 Ala Lys Ser Cys Ala Pro Asn Lys Ala Asp Val Ile Leu Val Phe Cys  
 20 25 30  
 Tyr Pro Lys Thr Ile Ile Thr Lys Ile Pro Glu Cys Pro Tyr Gly Trp  
 35 40 45  
 Glu Val His Gln Leu Ala Leu Gly Gly Leu Cys Tyr Asn Gly Val His  
 50 55 60  
 Glu Gly Gly Tyr Tyr Gln Phe Val Ile Pro Asp Leu Ser Pro Lys Asn  
 65 70 75 80  
 Lys Ser Tyr Cys Gly Thr Gln Ser Glu Tyr Lys Pro Pro Ile Tyr His  
 85 90 95  
 Phe Tyr Ser His Ile Val Ser Asn Asp Thr Thr Val Ile Val Lys Asn  
 100 105 110  
 Gln Pro Val Asn Tyr Ser Phe Ser Cys Thr Tyr His Ser Thr Tyr Leu  
 115 120 125  
 Val Asn Gln Ala Ala Phe Asp Gln Arg Val Ala Thr Val His Val Lys



130                                      135                                      140  
 Asn Gly Ser Met Gly Thr Phe Glu Ser Gln Leu Ser Leu Asn Phe Tyr  
 145                                      150                                      155                                      160  
 Thr Asn Ala Lys Phe Ser Ile Lys Lys Glu Ala Pro Phe Val Leu Glu  
 165                                      170                                      175  
 Ala Ser Glu Ile Gly Ser Asp Leu Phe Ala Gly Val Glu Ala Lys Gly  
 180                                      185                                      190  
 Leu Ser Ile Arg Phe Lys Val Val Leu Asn Ser Cys Trp Ala Thr Pro  
 195                                      200                                      205  
 Ser Ala Asp Phe Met Tyr Pro Leu Gln Trp Gln Leu Ile Asn Lys Gly  
 210                                      215                                      220  
 Cys Pro Thr Asp Glu Thr Val Leu Val His Glu Asn Gly Arg Asp His  
 225                                      230                                      235                                      240  
 Arg Ala Thr Phe Gln Phe Asn Ala Phe Arg Phe Gln Asn Ile Pro Lys  
 245                                      250                                      255  
 Leu Ser Lys Val Trp Leu His Cys Glu Thr Phe Ile Cys Asp Ser Glu  
 260                                      265                                      270  
 Lys Leu Ser Cys Pro Val Thr Cys Asp Lys Arg Lys Arg Leu Leu Arg  
 275                                      280                                      285  
 Asp Gln Thr Gly Gly Val Leu Val Val Glu Leu Ser Leu Arg Ser Arg  
 290                                      295                                      300  
 Gly Phe Ser Ser Leu Tyr Ser Phe Ser Asp Val Leu His His Leu Ile  
 305                                      310                                      315                                      320  
 Met Met Leu Gly Ile Cys Ala Val Leu  
 325

<210> 143  
 <211> 3909  
 <212> DNA  
 <213> Homo sapiens

<400> 143  
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 ccctttttct gtgagaacta ggagcctgtc ctccatgttt tataagtatt gacattacac 120  
 agtgtaaca atgcatccac agagcttggc tgaagaggaa ataaaaacag aacaggaggt 180  
 ggtagagggc atggatatct ctactcgtc caaagatcct ggctctgcag agagaacagc 240  
 ccagaaaaga aagttcccca gccctccaca ttcttccaat ggccactcgc cgcaggacac 300  
 atcaacaagc cccattaaaa agaaaaagaa acctggctta ctgaacagta acaataagga 360  
 gcagtcagaa ctaagacatg gtccgtttta ctatatgaag cagccactca ccacagaccc 420  
 tgttgatggt gtaccgcagg atggacggaa tgatttctac tgctggggtt gtcaccggga 480  
 aggccaaagtc ctttgctgtg agctctgtcc ccgggtttat cacgctaagt gtctgagact 540  
 gacatcggaa ccagaggggg actggttttg tcctgaatgt gagaaaatta cagtagcaga 600  
 atgcatcgag acccagagta aagccatgac aatgctcacc attgaacagt taccctacct 660  
 gctcaagttt gccattcaga aaatgaaaca gccagggaca gatgcattcc agaagcccgt 720

|             |             |            |             |            |             |      |
|-------------|-------------|------------|-------------|------------|-------------|------|
| tccattggaa  | cagcaccctg  | actatgcgga | atacatcttc  | catccaatgg | acctttgtac  | 780  |
| attggaaaag  | aatgcgaaaa  | agaaaatgta | tggctgcaca  | gaagccttcc | tggctgatgc  | 840  |
| aaagtggatt  | ttgcacaact  | gcatcattta | taatggggga  | aatcacaaat | tgacgcaaat  | 900  |
| agcgaaagta  | gtcatcaaaa  | tctgtgaaca | tgagatgaat  | gaaatcgaag | tatgtccaga  | 960  |
| atgttatcta  | gctgcttgcc  | aaaaacgaga | taactgggtt  | tgtgagcctt | gtagcaatcc  | 1020 |
| acatcctttg  | gtctggggcca | aactgaaggg | gtttccattc  | tggcctgcaa | aagctctaag  | 1080 |
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<210> 144

<211> 1206

<212> PRT

<213> Homo sapiens

<400> 144

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | His | Pro | Gln | Ser | Leu | Ala | Glu | Glu | Glu | Ile | Lys | Thr | Glu | Gln | Glu |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Val | Val | Glu | Gly | Met | Asp | Ile | Ser | Thr | Arg | Ser | Lys | Asp | Pro | Gly | Ser |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Ala | Glu | Arg | Thr | Ala | Gln | Lys | Arg | Lys | Phe | Pro | Ser | Pro | Pro | His | Ser |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Ser | Asn | Gly | His | Ser | Pro | Gln | Asp | Thr | Ser | Thr | Ser | Pro | Ile | Lys | Lys |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Lys | Lys | Lys | Pro | Gly | Leu | Leu | Asn | Ser | Asn | Asn | Lys | Glu | Gln | Ser | Glu |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Leu | Arg | His | Gly | Pro | Phe | Tyr | Tyr | Met | Lys | Gln | Pro | Leu | Thr | Thr | Asp |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Pro | Val | Asp | Val | Val | Pro | Gln | Asp | Gly | Arg | Asn | Asp | Phe | Tyr | Cys | Trp |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Val | Cys | His | Arg | Glu | Gly | Gln | Val | Leu | Cys | Cys | Glu | Leu | Cys | Pro | Arg |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Val | Tyr | His | Ala | Lys | Cys | Leu | Arg | Leu | Thr | Ser | Glu | Pro | Glu | Gly | Asp |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Trp | Phe | Cys | Pro | Glu | Cys | Glu | Lys | Ile | Thr | Val | Ala | Glu | Cys | Ile | Glu |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Thr | Gln | Ser | Lys | Ala | Met | Thr | Met | Leu | Thr | Ile | Glu | Gln | Leu | Ser | Tyr |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Leu | Leu | Lys | Phe | Ala | Ile | Gln | Lys | Met | Lys | Gln | Pro | Gly | Thr | Asp | Ala |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Phe | Gln | Lys | Pro | Val | Pro | Leu | Glu | Gln | His | Pro | Asp | Tyr | Ala | Glu | Tyr |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Ile | Phe | His | Pro | Met | Asp | Leu | Cys | Thr | Leu | Glu | Lys | Asn | Ala | Lys | Lys |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Lys | Met | Tyr | Gly | Cys | Thr | Glu | Ala | Phe | Leu | Ala | Asp | Ala | Lys | Trp | Ile |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Leu | His | Asn | Cys | Ile | Ile | Tyr | Asn | Gly | Gly | Asn | His | Lys | Leu | Thr | Gln |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Ile | Ala | Lys | Val | Val | Ile | Lys | Ile | Cys | Glu | His | Glu | Met | Asn | Glu | Ile |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Glu | Val | Cys | Pro | Glu | Cys | Tyr | Leu | Ala | Ala | Cys | Gln | Lys | Arg | Asp | Asn |

|   |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---|-----|-----|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| 275   | 280 | 285 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Trp Phe Cys Glu Pro Cys Ser Asn Pro His Pro Leu Val Trp Ala Lys |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 290   | 295 | 300 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Leu Lys Gly Phe Pro Phe Trp Pro Ala Lys Ala Leu Arg Asp Lys Asp |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 305   | 310 | 315 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Gly Gln Val Asp Ala Arg Phe Phe Gly Gln His Asp Arg Ala Trp Val |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   | 325 | 330 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Pro Ile Asn Asn Cys Tyr Leu Met Ser Lys Glu Ile Pro Phe Ser Val |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   | 340 | 345 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Lys Lys Thr Lys Ser Ile Phe Asn Ser Ala Met Gln Glu Met Glu Val |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   | 355 | 360 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Tyr Val Glu Asn Ile Arg Arg Lys Phe Gly Val Phe Asn Tyr Ser Pro |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   | 370 | 375 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Phe Arg Thr Pro Tyr Thr Pro Asn Ser Gln Tyr Gln Met Leu Leu Asp |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   | 385 | 390 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Pro Thr Asn Pro Ser Ala Gly Thr Ala Lys Ile Asp Lys Gln Glu Lys |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   | 405 | 410 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Val Lys Leu Asn Phe Asp Met Thr Ala Ser Pro Lys Ile Leu Met Ser |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   | 420 | 425 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Lys Pro Val Leu Ser Gly Gly Thr Gly Arg Arg Ile Ser Leu Ser Asp |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   | 435 | 440 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Met Pro Arg Ser Pro Met Ser Thr Asn Ser Ser Val His Thr Gly Ser |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   | 450 | 455 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Asp Val Glu Gln Asp Ala Glu Lys Lys Ala Thr Ser Ser His Phe Ser |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   | 465 | 470 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Ala Ser Glu Glu Ser Met Asp Phe Leu Asp Lys Ser Thr Ala Ser Pro |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   | 485 | 490 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Ala Ser Thr Lys Thr Gly Gln Ala Gly Ser Leu Ser Gly Ser Pro Lys |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   | 500 | 505 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Pro Phe Ser Pro Gln Leu Ser Ala Pro Ile Thr Thr Lys Thr Asp Lys |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   | 515 | 520 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Thr Ser Thr Thr Gly Ser Ile Leu Asn Leu Asn Leu Asp Arg Ser Lys |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   | 530 | 535 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Ala Glu Met Asp Leu Lys Glu Leu Ser Glu Ser Val Gln Gln Gln Ser |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   | 545 | 550 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Thr Pro Val Pro Leu Ile Ser Pro Lys Arg Gln Ile Arg Ser Arg Phe |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   | 565 | 570 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Gln Leu Asn Leu Asp Lys Thr Ile Glu Ser Cys Lys Ala Gln Leu Gly |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| 580 |     |     |     |     | 585 |     |     |     |     | 590 |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Asn | Glu | Ile | Ser | Glu | Asp | Val | Tyr | Thr | Ala | Val | Glu | His | Ser | Asp |
|     | 595 |     |     |     |     |     | 600 |     |     |     |     | 605 |     |     |     |
| Ser | Glu | Asp | Ser | Glu | Lys | Ser | Asp | Ser | Ser | Asp | Ser | Glu | Tyr | Ile | Ser |
|     | 610 |     |     |     |     | 615 |     |     |     |     | 620 |     |     |     |     |
| Asp | Asp | Glu | Gln | Lys | Ser | Lys | Asn | Glu | Pro | Glu | Asp | Thr | Glu | Asp | Lys |
| 625 |     |     |     |     | 630 |     |     |     |     | 635 |     |     |     |     | 640 |
| Glu | Gly | Cys | Gln | Met | Asp | Lys | Glu | Pro | Ser | Ala | Val | Lys | Lys | Lys | Pro |
|     |     |     |     | 645 |     |     |     |     | 650 |     |     |     |     |     | 655 |
| Lys | Pro | Thr | Asn | Pro | Val | Glu | Ile | Lys | Glu | Glu | Leu | Lys | Ser | Thr | Ser |
|     |     |     | 660 |     |     |     |     | 665 |     |     |     |     | 670 |     |     |
| Pro | Ala | Ser | Glu | Lys | Ala | Asp | Pro | Gly | Ala | Val | Lys | Asp | Lys | Ala | Ser |
|     | 675 |     |     |     |     |     | 680 |     |     |     |     | 685 |     |     |     |
| Pro | Glu | Pro | Glu | Lys | Asp | Phe | Ser | Glu | Lys | Ala | Lys | Pro | Ser | Pro | His |
|     | 690 |     |     |     |     | 695 |     |     |     |     | 700 |     |     |     |     |
| Pro | Ile | Lys | Asp | Lys | Leu | Lys | Gly | Lys | Asp | Glu | Thr | Asp | Ser | Pro | Thr |
| 705 |     |     |     |     | 710 |     |     |     |     | 715 |     |     |     |     | 720 |
| Val | His | Leu | Gly | Leu | Asp | Ser | Asp | Ser | Glu | Ser | Glu | Leu | Val | Ile | Asp |
|     |     |     |     | 725 |     |     |     |     | 730 |     |     |     |     | 735 |     |
| Leu | Gly | Glu | Asp | His | Ser | Gly | Arg | Glu | Gly | Arg | Lys | Asn | Lys | Lys | Glu |
|     |     |     | 740 |     |     |     |     | 745 |     |     |     |     | 750 |     |     |
| Pro | Lys | Glu | Pro | Ser | Pro | Lys | Gln | Asp | Val | Val | Gly | Lys | Thr | Pro | Pro |
|     | 755 |     |     |     |     |     | 760 |     |     |     |     | 765 |     |     |     |
| Ser | Thr | Thr | Val | Gly | Ser | His | Ser | Pro | Pro | Glu | Thr | Pro | Val | Leu | Thr |
|     | 770 |     |     |     |     | 775 |     |     |     |     | 780 |     |     |     |     |
| Arg | Ser | Ser | Ala | Gln | Thr | Ser | Ala | Ala | Gly | Ala | Thr | Ala | Thr | Thr | Ser |
| 785 |     |     |     |     | 790 |     |     |     |     | 795 |     |     |     |     | 800 |
| Thr | Ser | Ser | Thr | Val | Thr | Val | Thr | Ala | Pro | Ala | Pro | Ala | Ala | Thr | Gly |
|     |     |     |     | 805 |     |     |     |     | 810 |     |     |     |     | 815 |     |
| Ser | Pro | Val | Lys | Lys | Gln | Arg | Pro | Leu | Leu | Pro | Lys | Glu | Thr | Ala | Pro |
|     |     |     | 820 |     |     |     |     | 825 |     |     |     |     | 830 |     |     |
| Ala | Val | Gln | Arg | Val | Val | Trp | Asn | Ser | Ser | Ser | Lys | Phe | Gln | Thr | Ser |
|     | 835 |     |     |     |     |     | 840 |     |     |     |     | 845 |     |     |     |
| Ser | Gln | Lys | Trp | His | Met | Gln | Lys | Met | Gln | Arg | Gln | Gln | Gln | Gln | Gln |
|     | 850 |     |     |     |     | 855 |     |     |     |     | 860 |     |     |     |     |
| Gln | Gln | Gln | Asn | Gln | Gln | Gln | Gln | Pro | Gln | Ser | Ser | Gln | Gly | Thr | Arg |
| 865 |     |     |     |     | 870 |     |     |     |     | 875 |     |     |     |     | 880 |
| Tyr | Gln | Thr | Arg | Gln | Ala | Val | Lys | Ala | Val | Gln | Gln | Lys | Glu | Ile | Thr |

|   |   |  |      |  |      |
|---|---|--|------|--|------|
|   | 885   |  | 890  |  | 895  |
| Gln Ser Pro   | Ser Thr Ser Thr Ile Thr Leu Val Thr Ser Thr Gln Ser |  |      |  |      |
|   | 900   |  | 905  |  | 910  |
| Ser Pro Leu Val Thr Ser Ser Gly Ser Met Ser Thr Leu Val Ser Ser |   |  |      |  |      |
|   | 915   |  | 920  |  | 925  |
| Val Asn Ala Asp Leu Pro Ile Ala Thr Ala Ser Ala Asp Val Ala Ala |   |  |      |  |      |
|   | 930   |  | 935  |  | 940  |
| Asp Ile Ala Lys Tyr Thr Ser Lys Met Met Asp Ala Ile Lys Gly Thr |   |  |      |  |      |
|   | 945   |  | 950  |  | 955  |
| Met Thr Glu Ile Tyr Asn Asp Leu Ser Lys Asn Thr Thr Gly Ser Thr |   |  |      |  |      |
|   |   |  | 965  |  | 970  |
|   |   |  |      |  | 975  |
| Ile Ala Glu Ile Arg Arg Leu Arg Ile Glu Ile Glu Lys Leu Gln Trp |   |  |      |  |      |
|   |   |  | 980  |  | 985  |
|   |   |  |      |  | 990  |
| Leu His Gln Gln Glu Leu Ser Glu Met Lys His Asn Leu Glu Leu Thr |   |  |      |  |      |
|   |   |  | 995  |  | 1000 |
|   |   |  |      |  | 1005 |
| Met Ala Glu Met Arg Gln Ser Leu Glu Gln Glu Arg Asp Arg Leu Ile |   |  |      |  |      |
|   |   |  | 1010 |  | 1015 |
|   |   |  |      |  | 1020 |
| Ala Glu Val Lys Lys Gln Leu Glu Leu Glu Lys Gln Gln Ala Val Asp |   |  |      |  |      |
|   |   |  | 1025 |  | 1030 |
|   |   |  |      |  | 1035 |
|   |   |  |      |  | 1040 |
| Glu Thr Lys Lys Lys Gln Trp Cys Ala Asn Cys Lys Lys Glu Ala Ile |   |  |      |  |      |
|   |   |  | 1045 |  | 1050 |
|   |   |  |      |  | 1055 |
| Phe Tyr Cys Cys Trp Asn Thr Ser Tyr Cys Asp Tyr Pro Cys Gln Gln |   |  |      |  |      |
|   |   |  | 1060 |  | 1065 |
|   |   |  |      |  | 1070 |
| Ala His Trp Pro Glu His Met Lys Ser Cys Thr Gln Ser Ala Thr Ala |   |  |      |  |      |
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|   |   |  |      |  | 1085 |
| Pro Gln Gln Glu Ala Asp Ala Glu Val Asn Thr Glu Thr Leu Asn Lys |   |  |      |  |      |
|   |   |  | 1090 |  | 1095 |
|   |   |  |      |  | 1100 |
| Ser Ser Gln Gly Ser Ser Ser Ser Thr Gln Ser Ala Pro Ser Glu Thr |   |  |      |  |      |
|   |   |  | 1105 |  | 1110 |
|   |   |  |      |  | 1115 |
|   |   |  |      |  | 1120 |
| Ala Ser Ala Ser Lys Glu Lys Glu Thr Ser Ala Glu Lys Ser Lys Glu |   |  |      |  |      |
|   |   |  | 1125 |  | 1130 |
|   |   |  |      |  | 1135 |
| Ser Gly Ser Thr Leu Asp Leu Ser Gly Ser Arg Glu Thr Pro Ser Ser |   |  |      |  |      |
|   |   |  | 1140 |  | 1145 |
|   |   |  |      |  | 1150 |
| Ile Leu Leu Gly Ser Asn Gln Gly Ser Asp His Ser Arg Ser Asn Lys |   |  |      |  |      |
|   |   |  | 1155 |  | 1160 |
|   |   |  |      |  | 1165 |
| Ser Ser Trp Ser Ser Ser Asp Glu Lys Arg Gly Ser Thr Arg Ser Asp |   |  |      |  |      |
|   |   |  | 1170 |  | 1175 |
|   |   |  |      |  | 1180 |
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Ile Phe Ala Glu Arg Ala Tyr Ser Ala Val Val Phe Asp Ser Leu Val  
35 40 45

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Asn | Phe | Val | Cys | His | Thr | Cys | Phe | Lys | Arg | Gln | Glu | Lys | Leu | His | Arg |  |
| 50  |     |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |  |
| Cys | Gly | Gln | Cys | Lys | Phe | Ala | His | Tyr | Cys | Asp | Arg | Thr | Cys | Gln | Lys |  |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |  |
| Asp | Ala | Trp | Leu | Asn | His | Lys | Asn | Glu | Cys | Ser | Ala | Ile | Lys | Arg | Tyr |  |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |  |
| Gly | Lys | Val | Pro | Asn | Glu | Asn | Ile | Arg | Leu | Ala | Ala | Arg | Ile | Met | Trp |  |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |  |
| Arg | Val | Glu | Arg | Glu | Gly | Thr | Gly | Leu | Thr | Glu | Gly | Cys | Leu | Val | Ser |  |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |  |
| Val | Asp | Asp | Leu | Gln | Asn | His | Val | Glu | His | Phe | Gly | Glu | Glu | Glu | Gln |  |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |  |
| Lys | Asp | Leu | Arg | Val | Asp | Val | Asp | Thr | Phe | Leu | Gln | Tyr | Trp | Pro | Pro |  |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |  |
| Gln | Ser | Gln | Pro | Phe | Ser | Met | Gln | Tyr | Ile | Ser | His | Ile | Phe | Gly | Val |  |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |  |
| Ile | Asn | Cys | Asn | Gly | Phe | Thr | Leu | Ser | Asp | Gln | Arg | Gly | Leu | Gln | Ala |  |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |  |
| Val | Gly | Val | Gly | Ile | Phe | Pro | Asn | Leu | Gly | Leu | Val | Asn | His | Asp | Cys |  |
|     | 195 |     |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |  |
| Trp | Pro | Asn | Cys | Thr | Val | Ile | Phe | Asn | Asn | Gly | Asn | His | Glu | Ala | Val |  |
|     | 210 |     |     |     |     | 215 |     |     |     |     |     | 220 |     |     |     |  |
| Lys | Ser | Met | Phe | His | Thr | Gln | Met | Arg | Ile | Glu | Leu | Arg | Ala | Leu | Gly |  |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |  |
| Lys | Ile | Ser | Glu | Gly | Glu | Glu | Leu | Thr | Val | Ser | Tyr | Ile | Asp | Phe | Leu |  |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |  |
| Asn | Val | Ser | Glu | Glu | Arg | Lys | Arg | Gln | Leu | Lys | Lys | Gln | Tyr | Tyr | Phe |  |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |  |
| Asp | Cys | Thr | Cys | Glu | His | Cys | Gln | Lys | Lys | Leu | Lys | Asp | Asp | Leu | Phe |  |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |  |
| Leu | Gly | Val | Lys | Asp | Asn | Pro | Lys | Pro | Ser | Gln | Glu | Val | Val | Lys | Glu |  |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |  |
| Met | Ile | Gln | Phe | Ser | Lys | Asp | Thr | Leu | Glu | Lys | Ile | Asp | Lys | Ala | Arg |  |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |  |
| Ser | Glu | Gly | Leu | Tyr | His | Glu | Val | Val | Lys | Leu | Cys | Arg | Glu | Cys | Leu |  |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |  |
| Glu | Lys | Gln | Glu | Pro | Val | Phe | Ala | Asp | Thr | Asn | Ile | Tyr | Met | Leu | Arg |  |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |  |



Met Leu Ser Ile Val Ser Glu Val Leu Ser Tyr Leu Gln Ala Phe Glu  
355 360 365

Glu Ala Ser Phe Tyr Ala Arg Arg Met Val Asp Gly Tyr Met Lys Leu  
370 375 380

Tyr His Pro Asn Asn Ala Gln Leu Gly Met Ala Val Met Arg Ala Gly  
385 390 395 400

Leu Thr Asn Trp His Ala Gly Asn Ile Glu Val Gly His Gly Met Ile  
405 410 415

Cys Lys Ala Tyr Ala Ile Leu Leu Val Thr His Gly Pro Ser His Pro  
420 425 430

Ile Thr Lys Asp Leu Glu Ala Met Arg Val Gln Thr Glu Met Glu Leu  
435 440 445

Arg Met Phe Arg Gln Asn Glu Phe Met Tyr Tyr Lys Met Arg Glu Ala  
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Ala Leu Asn Asn Gln Pro Met Gln Val Met Ala Glu Pro Ser Asn Glu  
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Pro Ser Pro Ala Leu Phe His Lys Lys Gln  
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<400> 148

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Thr | Ile | Gly | Arg | Met | Glu | Asn | Val | Glu | Val | Phe | Thr | Ala | Glu | Gly | 1   | 5   | 10  | 15  |
| Lys | Gly | Arg | Gly | Leu | Lys | Ala | Thr | Lys | Glu | Phe | Trp | Ala | Ala | Asp | Ile | 20  | 25  | 30  |     |
| Ile | Phe | Ala | Asp | Arg | Ala | Tyr | Ser | Ala | Val | Val | Phe | Asp | Ser | Leu | Val | 35  | 40  | 45  |     |
| Asn | Phe | Val | Cys | His | Thr | Cys | Phe | Lys | Arg | Gln | Glu | Lys | Leu | His | Arg | 50  | 55  | 60  |     |
| Cys | Gly | Gln | Cys | Lys | Phe | Ala | His | Tyr | Cys | Asp | Arg | Thr | Cys | Gln | Lys | 65  | 70  | 75  | 80  |
| Asp | Ala | Trp | Leu | Asn | His | Lys | Asn | Glu | Cys | Ser | Ala | Ile | Lys | Arg | Tyr | 85  | 90  | 95  |     |
| Gly | Lys | Val | Pro | Asn | Glu | Asn | Ile | Arg | Leu | Ala | Ala | Arg | Ile | Met | Trp | 100 | 105 | 110 |     |
| Arg | Val | Glu | Arg | Glu | Gly | Thr | Gly | Leu | Thr | Glu | Gly | Cys | Leu | Val | Ser | 115 | 120 | 125 |     |
| Val | Asp | Asp | Leu | Gln | Asn | His | Val | Glu | His | Phe | Gly | Glu | Glu | Glu | Gln | 130 | 135 | 140 |     |
| Lys | Asp | Leu | Arg | Val | Asp | Val | Asp | Thr | Phe | Leu | Gln | Tyr | Trp | Pro | Pro | 145 | 150 | 155 | 160 |
| Gln | Ser | Gln | Gln | Phe | Ser | Met | Gln | Tyr | Ile | Ser | His | Ile | Phe | Gly | Val | 165 | 170 | 175 |     |
| Ile | Asn | Cys | Asn | Gly | Phe | Thr | Leu | Ser | Asp | Gln | Arg | Gly | Leu | Gln | Ala | 180 | 185 | 190 |     |
| Val | Gly | Val | Gly | Ile | Phe | Pro | Asn | Leu | Gly | Leu | Val | Asn | His | Asp | Cys | 195 | 200 | 205 |     |
| Trp | Pro | Asn | Cys | Thr | Val | Ile | Phe | Asn | Asn | Gly | Asn | His | Glu | Ala | Val | 210 | 215 | 220 |     |
| Lys | Ser | Met | Phe | His | Thr | Gln | Met | Arg | Ile | Glu | Leu | Arg | Ala | Leu | Gly | 225 | 230 | 235 | 240 |
| Lys | Ile | Ser | Glu | Gly | Glu | Glu | Leu | Thr | Val | Ser | Tyr | Ile | Asp | Phe | Leu |     |     |     |     |



|             |             |             |             |             |             |      |
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| gcaatcaaat  | tagaactcag  | gattaagaaa  | ctcactcaaa  | accacacaac  | tacatggaaa  | 360  |
| ctgaaaaacc  | tgctcctgaa  | taactacttg  | gtaaaataatg | aaattaaggc  | agaaataaat  | 420  |
| aagttctgtg  | aaaccaatga  | gaacaaagac  | acaacgtacc  | agaatttctg  | ggacacagct  | 480  |
| aaagcagtg   | ttagagggaa  | atttatagca  | ctaaatgcgc  | acaggagaaa  | gcaagaaaga  | 540  |
| tgtaaaatca  | acaccctaac  | atcacaaat   | aaagaactag  | agaagcaaga  | gcaaacaaat  | 600  |
| tcaaaagcta  | acagaagaca  | agaaataact  | aagatcatag  | cagaactgaa  | ggagataaag  | 660  |
| acacgaaaaa  | cccatcaaaa  | aatcaatgaa  | tctgggagct  | ggttttttga  | aaagattaac  | 720  |
| aaaatagata  | gacaactagc  | cagactaata  | aagaagagaa  | gagagaagaa  | tcaaatagat  | 780  |
| gcaataaaaa  | atgataaagg  | ggatatcact  | gctgatccca  | cagaaatata  | aactaccatc  | 840  |
| agagaatact  | ataaacacct  | ctatgcaaat  | aaactagaaa  | atctagaaga  | aatggataaa  | 900  |
| ttcctggcca  | catgcaccct  | cccaagacta  | aaccaggaag  | agttagaatc  | cctgaataga  | 960  |
| caaataacaa  | gttctgaaat  | taaggcagta  | attaatagcc  | taccaaccaa  | acaaaagccc  | 1020 |
| ggaccagatg  | gattcacagc  | tgaattctac  | cagaggtaga  | aagaggagct  | ggtaccattc  | 1080 |
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| cctatatccc  | tgatgaacat  | cgatgtgaaa  | atcctcaata  | aaatactggc  | aaaccaaatac | 1260 |
| ttgcagcaca  | tcaaaaagct  | tatccacgat  | gatcaagttg  | gcttcatccc  | tgggatgcaa  | 1320 |
| ggctggttca  | acatatgcaa  | atcaatcaac  | ataatccatc  | acataaatag  | caccaatgac  | 1380 |
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| agaatctaca  | aggaacttaa  | acaaatttac  | aagaaaaaaa  | caaacaaccc  | tatcaaaaag  | 2820 |
| tgggcaaaag  | ctatgaacag  | acacttctca  | aaagaagaca  | tttatgcagc  | caaaagacat  | 2880 |
| atgaaaaaat  | ggtcatcatc  | actggtcttc  | agggaaatgc  | aaatcaaaac  | cacaatgaga  | 2940 |
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| caaatcaaaa  | ccacaatgag  | ataccatctc  | atgccagtta  | gaatggtgat  | cattagaaag  | 3060 |
| tcaggaaaca  | acacatgcag  | aggatgtgga  | gaaataggaa  | tgctttttaca | ctgttggtgg  | 3120 |
| gagtgtaaac  | tagttcaacc  | attgtggaag  | acagtgtggc  | gattcctcaa  | ggatctagaa  | 3180 |
| ccagaataac  | cattagaccc  | agcaatccca  | ttactgggta  | tatacccaaa  | tgattataaa  | 3240 |
| tcatgctact  | ataaagacac  | atgcacacgt  | atgtttattg  | cggcactatt  | cacaatagca  | 3300 |
| aagacttgga  | accaacccaa  | atgcccata   | gtgagagtca  | taaagaaaat  | gtggcacata  | 3360 |
| tacatcatgg  | aatactatgc  | agccataaaa  | aaggatgagt  | tcatgtcctt  | tgaggggaca  | 3420 |
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| cgcttggtct  | cactcgtaag  | ttggagttga  | acaatgagaa  | cacatggaca  | cagggagggg  | 3540 |
| aacaacacca  | gggcctgtca  | gggggtaggg  | gggatagggg  | agggatagca  | ttaagagaaa  | 3600 |

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<212> PRT

<213> Homo sapiens

<400> 150

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Leu Lys Asn Leu Leu Leu Asn Asn Tyr Leu Val Asn Asn Glu Ile Lys  
35 40 45

Ala Glu Ile Asn Lys Phe Cys Glu Thr Asn Glu Asn Lys Asp Thr Thr  
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Tyr Gln Asn Phe Trp Asp Thr Ala Lys Ala Val Val Arg Gly Lys Phe  
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Ile Ala Leu Asn Ala His Arg Arg Lys Gln Glu Arg Cys Lys Ile Asn  
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Thr Leu Thr Ser Gln Leu Lys Glu Leu Glu Lys Gln Glu Gln Thr Asn  
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Ser Lys Ala Asn Arg Arg Gln Glu Ile Thr Lys Ile Ile Ala Glu Leu  
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Lys Glu Ile Lys Thr Arg Lys Thr His Gln Lys Ile Asn Glu Ser Gly  
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Leu Ile Lys Lys Arg Arg Glu Lys Asn Gln Ile Asp Ala Ile Lys Asn  
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Asp Lys Gly Asp Ile Thr Ala Asp Pro Thr Glu Ile Gln Thr Thr Ile  
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Arg Glu Tyr Tyr Lys His Leu Tyr Ala Asn Lys Leu Glu Asn Leu Glu  
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Glu Met Asp Lys Phe Leu Ala Thr Cys Thr Leu Pro Arg Leu Asn Gln  
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Glu Glu Leu Glu Ser Leu Asn Arg Gln Ile Thr Ser Ser Glu Ile Lys  
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Ala Val Ile Asn Ser Leu Pro Thr Lys Gln Lys Pro Gly Pro Asp Gly  
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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Phe | Thr | Ala | Glu | Phe | Tyr | Gln | Arg | Tyr | Lys | Glu | Glu | Leu | Val | Pro | Phe |  |
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| Leu | Leu | Lys | Leu | Phe | Gln | Thr | Thr | Glu | Lys | Glu | Gly | Leu | Leu | Pro | Asn |  |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |  |
| Ser | Phe | Tyr | Glu | Ala | Ser | Ile | Met | Leu | Met | Pro | Lys | Ser | Gly | Arg | Asp |  |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |  |
| Thr | Thr | Lys | Lys | Glu | Asn | Phe | Arg | Pro | Ile | Ser | Leu | Met | Asn | Ile | Asp |  |
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| Val | Lys | Ile | Leu | Asn | Lys | Ile | Leu | Ala | Asn | Gln | Ile | Leu | Gln | His | Ile |  |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |  |
| Lys | Lys | Leu | Ile | His | Asp | Asp | Gln | Val | Gly | Phe | Ile | Pro | Gly | Met | Gln |  |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |  |
| Gly | Trp | Phe | Asn | Ile | Cys | Lys | Ser | Ile | Asn | Ile | Ile | His | His | Ile | Asn |  |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |  |
| Ser | Thr | Asn | Asp | Lys | Asn | His | Met | Ile | Ile | Ser | Ile | Asp | Ala | Glu | Lys |  |
|     | 370 |     |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |  |
| Ala | Phe | Gly | Lys | Ile | Gln | His | Pro | Phe | Met | Leu | Lys | Thr | Leu | Asn | Lys |  |
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| Leu | Gly | Ile | Asp | Gly | Thr | Tyr | Leu | Lys | Ile | Ile | Arg | Ala | Val | Tyr | Asp |  |
|     |     |     | 405 |     |     |     |     |     | 410 |     |     |     |     | 415 |     |  |
| Lys | Pro | Thr | Ala | Asn | Ile | Ile | Leu | Thr | Gly | Gln | Lys | Leu | Glu | Ala | Phe |  |
|     |     |     | 420 |     |     |     |     | 425 |     |     |     |     | 430 |     |     |  |
| Pro | Leu | Lys | Thr | Ser | Thr | Arg | Gln | Val | Cys | Pro | Leu | Ser | Pro | Leu | Leu |  |
|     |     | 435 |     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |  |
| Phe | Asn | Met | Val | Leu | Glu | Val | Leu | Ala | Arg | Ala | Ile | Arg | Gln | Glu | Lys |  |
|     | 450 |     |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     |  |
| Glu | Ile | Lys | His | Ile | Gln | Ile | Gly | Arg | Glu | Glu | Val | Lys | Leu | Ser | Leu |  |
| 465 |     |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |  |
| Phe | Ala | Asp | Asp | Met | Ile | Val | Tyr | Leu | Glu | Asn | Pro | Ile | Val | Ser | Ala |  |
|     |     |     |     | 485 |     |     |     |     | 490 |     |     |     |     | 495 |     |  |
| Gln | Asn | Leu | Leu | Lys | Leu | Ile | Arg | Asn | Phe | Ser | Lys | Val | Ser | Gly | Tyr |  |
|     |     | 500 |     |     |     |     |     | 505 |     |     |     |     | 510 |     |     |  |
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|     |     | 515 |     |     |     |     | 520 |     |     |     |     | 525 |     |     |     |  |
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Val His Asn Lys Ile Lys Ala Glu Ile Lys Met Phe Phe Glu Thr Asn  
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|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| Ile | Ser | Ile | Asp | Ala | Glu | Lys | Ala | Phe | Asp | Lys | Ile | Gln | Gln | Pro | Phe |  |  |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |  |  |
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|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |  |  |
| Ile | Ile | Arg | Ala | Ile | Tyr | Asp | Lys | Pro | Thr | Ala | Asn | Ile | Ile | Leu | Asn |  |  |
|     | 370 |     |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |  |  |
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| Arg | Ala | Ile | Arg | Gln | Glu | Lys | Glu | Ile | Lys | Gly | Ile | Gln | Leu | Gly | Lys |  |  |
|     |     |     | 420 |     |     |     |     | 425 |     |     |     |     |     | 430 |     |  |  |
| Glu | Glu | Val | Lys | Leu | Ser | Leu | Phe | Ala | Asp | Asp | Met | Ile | Leu | Tyr | Leu |  |  |
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| Phe | Ser | Lys | Val | Pro | Gly | Tyr | Lys | Ile | Asn | Val | Gln | Lys | Ser | Gln | Ala |  |  |
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| Phe | Leu | Tyr | Thr | Asn | Asn | Arg | Gln | Thr | Glu | Ser | Gln | Ile | Met | Ser | Glu |  |  |
|     |     |     |     | 485 |     |     |     |     | 490 |     |     |     |     | 495 |     |  |  |
| Leu | Pro | Phe | Thr | Ile | Ala | Ser | Lys | Arg | Ile | Lys | Tyr | Leu | Gly | Ile | Gln |  |  |
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| Leu | Thr | Arg | Asp | Val | Lys | Asp | Ser | Ser | Arg | Arg | Thr | Thr | Asn | Pro | Cys |  |  |
|     |     | 515 |     |     |     |     | 520 |     |     |     |     | 525 |     |     |     |  |  |
| Ser | Ile | Glu | Ile | Lys | Glu | Asp | Thr | Asn | Lys | Trp | Lys | Asn | Ile | Pro | Cys |  |  |
|     | 530 |     |     |     |     | 535 |     |     |     |     | 540 |     |     |     |     |  |  |
| Ser | Trp | Val | Arg | Arg | Ile | Asn | Ile | Val | Lys | Met | Ala | Ile | Leu | Pro | Lys |  |  |
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| Val | Ile | Tyr | Arg | Phe | Asn | Ala | Ile | Pro | Ile | Lys | Leu | Pro | Met | Ala | Phe |  |  |
|     |     |     | 565 |     |     |     |     |     | 570 |     |     |     |     | 575 |     |  |  |
| Phe | Thr | Glu | Leu | Glu | Lys | Thr | Thr | Leu | Lys | Phe | Ile | Trp | Asn | Gln | Lys |  |  |
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| Arg | Ala | Cys | Ile | Ala | Lys | Pro | Ala | Leu | Leu | Ser | Gln | Lys | Asn | Lys | Ala |  |  |
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Glu Leu Lys Glu Ile Glu Thr Gln Lys Thr Leu Gln Lys Ile Asn Glu
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Ser Arg Ser Trp Phe Phe Glu Lys Ile Asn Lys Ile Asp Arg Gln Leu
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<212> DNA

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Asp | Thr | Leu | Thr | Ser | Gln | Leu | Lys | Gln | Leu | Gln | Lys | Gln | Glu | Gln |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Thr | Leu | Ser | Lys | Ala | Ser | Arg | Arg | Gln | Glu | Ile | Thr | Lys | Ile | Arg | Ala |
|     | 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     | 80  |
| Glu | Leu | Lys | Glu | Ile | Glu | Thr | Gln | Lys | Thr | Leu | Gln | Lys | Ile | Asn | Glu |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Ser | Arg | Ser | Trp | Phe | Phe | Glu | Lys | Ile | Asn | Lys | Ile | Asp | Thr | Leu | Leu |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Ala | Arg | Leu | Ile | Lys | Lys | Lys | Arg | Glu | Lys | Asn | Gln | Ile | Asp | Ala | Ile |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Lys | Asn | Asp | Lys | Ala | Asp | Ile | Thr | Thr | Asp | Pro | Thr | Glu | Ile | Gln | Thr |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Thr | Ile | Arg | Glu | Tyr | Tyr | Lys | His | Leu | Tyr | Ala | Asn | Lys | Leu | Glu | Asn |
|     | 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     | 160 |
| Leu | Glu | Glu | Met | Asp | Lys | Phe | Leu | Asp | Thr | Tyr | Thr | Leu | Pro | Arg | Ile |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Asn | Gln | Glu | Glu | Val | Glu | Ser | Leu | Asn | Arg | Pro | Ile | Thr | Gly | Ser | Glu |
|     |     |     |     | 180 |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Ile | Glu | Ala | Ile | Ile | Asn | Ser | Leu | Pro | Thr | Lys | Lys | Ser | Pro | Gly | Pro |
|     | 195 |     |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Asp | Gly | Phe | Thr | Ala | Glu | Phe | Tyr | Gln | Lys | Tyr | Lys | Glu | Glu | Leu | Ile |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Pro | Phe | Leu | Leu | Lys | Leu | Phe | Gln | Ser | Ile | Glu | Lys | Glu | Gly | Ile | Leu |
|     | 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     | 240 |
| Pro | Asn | Ser | Phe | Asp | Glu | Ala | Ser | Ile | Ile | Leu | Ile | Pro | Lys | Pro | Gly |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Arg | Asp | Thr | Thr | Lys | Lys | Glu | Asn | Phe | Arg | Pro | Ile | Ser | Leu | Met | Asn |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Ile | Asp | Ala | Lys | Ile | Leu | Asn | Lys | Ile | Leu | Ala | Asn | Arg | Ile | Lys | Gln |
|     | 275 |     |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| His | Ile | Lys | Lys | Leu | Ile | His | His | Asp | Gln | Val | Gly | Phe | Ile | Pro | Gly |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |
| Met | Gln | Gly | Trp | Phe | Asn | Ile | Cys | Lys | Ser | Ile | Asn | Val | Ile | Gln | His |
|     | 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     | 320 |
| Ile | Asn | Arg | Thr | Lys | Asp | Lys | Asn | His | Met | Ile | Ile | Ser | Ile | Asp | Ala |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |
| Glu | Lys | Ala | Phe | Asp | Lys | Ile | Gln | Gln | His | Phe | Met | Leu | Lys | Thr | Leu |

| 340 |     |     |     |     |     |     |     |     |     | 345 |     |     |     |     | 350 |  |  |  |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|--|--|
| Asn | Lys | Leu | Gly | Ile | Asp | Gly | Thr | Tyr | Leu | Lys | Ile | Ile | Arg | Ala | Ile |  |  |  |  |
|     |     | 355 |     |     |     |     |     | 360 |     |     |     | 365 |     |     |     |  |  |  |  |
| Cys | Asp | Lys | Pro | Thr | Ala | Asn | Ile | Ile | Leu | Asn | Gly | Gln | Lys | Leu | Glu |  |  |  |  |
|     |     | 370 |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |  |  |  |  |
| Ala | Phe | Pro | Leu | Lys | Thr | Gly | Thr | Arg | Gln | Gly | Cys | Pro | Leu | Ser | Pro |  |  |  |  |
|     |     | 385 |     |     |     | 390 |     |     |     |     | 395 |     |     |     | 400 |  |  |  |  |
| Leu | Leu | Phe | Asn | Ile | Val | Leu | Glu | Val | Leu | Ala | Arg | Ala | Ile | Arg | Gln |  |  |  |  |
|     |     |     |     | 405 |     |     |     |     | 410 |     |     |     |     | 415 |     |  |  |  |  |
| Glu | Lys | Glu | Ile | Lys | Gly | Ile | Gln | Leu | Gly | Lys | Glu | Glu | Val | Lys | Leu |  |  |  |  |
|     |     |     | 420 |     |     |     |     | 425 |     |     |     |     | 430 |     |     |  |  |  |  |
| Ser | Leu | Phe | Ala | Asp | Asp | Met | Ile | Val | Tyr | Leu | Glu | Asn | Pro | Ile | Ile |  |  |  |  |
|     |     |     | 435 |     |     |     | 440 |     |     |     |     | 445 |     |     |     |  |  |  |  |
| Ser | Ala | Gln | Asn | Leu | Leu | Lys | Leu | Ile | Ser | Asn | Phe | Ser | Lys | Val | Ser |  |  |  |  |
|     |     | 450 |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     |  |  |  |  |
| Gly | Tyr | Lys | Ile | Asp | Val | Gln | Lys | Ser | Gln | Ala | Phe | Leu | Tyr | Thr | Asn |  |  |  |  |
|     |     |     |     |     | 470 |     |     |     | 475 |     |     |     |     |     | 480 |  |  |  |  |
| Thr | Asp | Gln | Thr | Glu | Ser | Gln | Ile | Met | Ser | Asp | Leu | Pro | Phe | Thr | Ile |  |  |  |  |
|     |     |     |     | 485 |     |     |     |     | 490 |     |     |     |     | 495 |     |  |  |  |  |
| Ala | Ser | Lys | Arg | Ile | Lys | Tyr | Leu | Gly | Ile | Gln | Leu | Thr | Arg | Asp | Val |  |  |  |  |
|     |     |     | 500 |     |     |     |     | 505 |     |     |     |     | 510 |     |     |  |  |  |  |
| Lys | Asp | Leu | Phe | Lys | Glu | Asn | Tyr | Lys | Pro | Leu | Leu | Asn | Glu | Ile | Lys |  |  |  |  |
|     |     | 515 |     |     |     |     | 520 |     |     |     |     | 525 |     |     |     |  |  |  |  |
| Lys | Asp | Thr | Asn | Lys | Trp | Lys | Asn | Ile | Pro | Gly | Ser | Trp | Ile | Gly | Arg |  |  |  |  |
|     |     | 530 |     |     |     | 535 |     |     |     |     | 540 |     |     |     |     |  |  |  |  |
| Ile | Asn | Ile | Val | Lys | Met | Ala | Ile | Glu | Pro | Lys | Val | Ile | Tyr | Arg | Phe |  |  |  |  |
|     |     |     |     |     | 550 |     |     |     | 555 |     |     |     |     |     | 560 |  |  |  |  |
| Asn | Ala | Ile | Pro | Ile | Lys | Leu | Pro | Met | Thr | Phe | Phe | Thr | Glu | Leu | Glu |  |  |  |  |
|     |     |     |     | 565 |     |     |     |     | 570 |     |     |     |     | 575 |     |  |  |  |  |
| Lys | Thr | Thr | Leu | Lys | Phe | Ile | Trp | Asn | Gln | Lys | Arg | Ala | His | Ile | Ala |  |  |  |  |
|     |     |     | 580 |     |     |     |     | 585 |     |     |     |     | 590 |     |     |  |  |  |  |
| Lys | Ser | Ile | Leu | Asn | Gln | Lys | Asn | Lys | Ala | Gly | Gly | Ile | Thr | Pro | Pro |  |  |  |  |
|     |     | 595 |     |     |     |     | 600 |     |     |     |     | 605 |     |     |     |  |  |  |  |
| Asp | Phe | Lys | Leu | Tyr | Tyr | Lys | Ala | Thr | Val | Asn | Lys | Thr | Ala | Trp | Tyr |  |  |  |  |
|     |     | 610 |     |     |     | 615 |     |     |     |     | 620 |     |     |     |     |  |  |  |  |
| Trp | Tyr | Gln | Asn | Arg | Asp | Ile | Asp | Gln | Trp | Asn | Arg | Thr | Asp | Pro | Ser |  |  |  |  |
|     |     |     |     |     | 630 |     |     |     | 635 |     |     |     |     | 640 |     |  |  |  |  |
| Glu | Ile | Met | Pro | His | Ile | Tyr | Asn | Tyr | Leu | Ile | Phe | Asp | Lys | Pro | Asp |  |  |  |  |

| 645 |     |     |     |     | 650 |     |     |     |     | 655 |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Lys | Lys | Lys | Gln | Trp | Gly | Lys | Asp | Ser | Leu | Phe | Asn | Lys | Trp | Cys | Trp |
|     |     |     | 660 |     |     |     |     | 665 |     |     |     |     | 670 |     |     |
| Glu | Asn | Trp | Leu | Ala | Ile | Gly | Arg | Lys | Leu | Lys | Leu | Asp | Pro | Phe | Leu |
|     |     | 675 |     |     |     |     | 680 |     |     |     |     | 685 |     |     |     |
| Thr | Pro | Tyr | Thr | Lys | Ile | Asn | Ser | Arg | Trp | Ile | Lys | Asp | Leu | Asn | Val |
|     | 690 |     |     |     |     | 695 |     |     |     |     | 700 |     |     |     |     |
| Arg | Pro | Lys | Thr | Ile | Lys | Thr | Leu | Glu | Gly | Asn | Leu | Gly | Ile | Thr | Ile |
| 705 |     |     |     |     | 710 |     |     |     |     | 715 |     |     |     |     | 720 |
| Glu | Asp | Thr | Gly | Met | Gly | Lys | Asp | Phe | Met | Ser | Lys | Thr | Pro | Lys | Ala |
|     |     |     |     | 725 |     |     |     |     | 730 |     |     |     |     | 735 |     |
| Met | Ala | Thr | Lys | Asp | Lys | Ile | Asp | Lys | Trp | Asp | Leu | Ile | Lys | Leu | Lys |
|     |     |     | 740 |     |     |     |     | 745 |     |     |     |     | 750 |     |     |
| Ser | Phe | Cys | Thr | Ala | Lys | Glu | Thr | Thr | Ile | Arg | Val | Asn | Arg | Gln | Pro |
|     |     | 755 |     |     |     |     | 760 |     |     |     |     | 765 |     |     |     |
| Thr | Lys | Trp | Glu | Lys | Leu | Phe | Ala | Thr | Tyr | Ser | Ser | Asp | Lys | Gly | Leu |
|     | 770 |     |     |     |     | 775 |     |     |     |     | 780 |     |     |     |     |
| Ile | Ser | Arg | Ile | Tyr | Lys | Glu | Leu | Lys | Gln | Ile | Tyr | Lys | Lys | Arg | Thr |
| 785 |     |     |     |     | 790 |     |     |     |     | 795 |     |     |     |     | 800 |
| Asn | Asn | Pro | Ile | Lys | Lys | Lys | Thr | Asn | Asn | Pro | Ile | Lys | Lys | Arg | Ala |
|     |     |     | 805 |     |     |     |     | 810 |     |     |     |     |     | 815 |     |
| Lys | Asp | Met | Asn | Arg | His | Phe | Ser | Lys | Glu | Asp | Ile | Tyr | Ala | Ala | Lys |
|     |     |     | 820 |     |     |     |     | 825 |     |     |     |     | 830 |     |     |
| Arg | His | Met | Lys | Lys | Cys | Ser | Ser | Ser | Leu | Ala | Ile | Arg | Glu | Met | Gln |
|     |     | 835 |     |     |     |     | 840 |     |     |     |     | 845 |     |     |     |
| Met | Lys | Thr | Thr | Met | Arg | Tyr | His | Leu | Thr | Pro | Val | Arg | Met | Ala | Ile |
|     | 850 |     |     |     |     | 855 |     |     |     |     | 860 |     |     |     |     |
| Ile | Lys | Lys | Ser | Gly | Asn | Asn | Arg | Cys | Trp | Arg | Gly | Cys | Gly | Glu | Ile |
| 865 |     |     |     |     | 870 |     |     |     |     | 875 |     |     |     |     | 880 |
| Gly | Thr | Leu | Leu | Arg | Cys | Trp | Trp | Asp | Cys | Lys | Leu | Val | Gln | Pro | Leu |
|     |     |     |     | 885 |     |     |     |     | 890 |     |     |     |     | 895 |     |
| Trp | Lys | Thr | Val | Trp | Arg | Phe | Leu | Arg | Asp | Leu | Glu | Leu | Glu | Ile | Pro |
|     |     |     | 900 |     |     |     |     | 905 |     |     |     |     | 910 |     |     |
| Phe | Asp | Pro | Ala | Ile | Pro | Leu | Leu | Gly | Ile | Tyr | Pro | Lys | Asp | Tyr | Lys |
|     |     | 915 |     |     |     |     | 920 |     |     |     |     | 925 |     |     |     |
| Ser | Cys | Cys | Tyr | Lys | Asp | Thr | Cys | Arg | Arg | Met | Phe | Ile | Ala | Ala | Leu |
|     | 930 |     |     |     |     | 935 |     |     |     |     | 940 |     |     |     |     |
| Phe | Thr | Ile | Ala | Lys | Thr | Trp | Asn | Gln | Pro | Lys | Cys | Pro | Thr | Met | Ile |



Asp Gly Leu Asp Gly Ala Tyr Val Ala Val Ala Asn His Ser Ser His  
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 Leu Asp Ala Pro Leu Val Phe Gly Ala Leu Pro Lys Arg Leu Ser Lys  
 65 70 75 80  
 Tyr Leu Ala Thr Gly Ala Ala Ala Asp Tyr Phe Phe Thr Ala Trp Trp  
 85 90 95  
 Lys Ala Ile Ala Pro Val Leu Phe Phe Asn Ala Phe Pro Val Asp Arg  
 100 105 110  
 Gly Lys Gly Lys Ser Lys Gln Gly Ala Arg Ser Pro Arg Ser His Arg  
 115 120 125  
 Gly Met Ala Gly Ser Leu Leu Thr Asp Gly Val Pro Leu Leu Ile Phe  
 130 135 140  
 Pro Glu Gly Thr Arg Ser Arg Thr Gly Ala Met Gly Thr Phe Lys Pro  
 145 150 155 160  
 Gly Ala Ala Ala Leu Ala Ile Ser Arg Gly Val Pro Val Ile Pro Ile  
 165 170 175  
 Ala Leu Val Gly Ala Trp Ala Ala Met Pro Ser Glu Gln Ala Arg Leu  
 180 185 190  
 Pro Lys Gly Arg Pro Leu Val His Val Ala Ile Gly His Pro Met Asp  
 195 200 205  
 Pro Val Pro Gly Glu Ile Ala His Gln Phe Ser Glu Arg Ile Arg Arg  
 210 215 220  
 Gln Val Ile Glu Leu His Asp Gln Thr Ala Arg Ala Tyr Gly Met Pro  
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 Ser Gly Asp Thr Ala Ser Thr Asn His Ser Thr  
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<210> 159

<211> 906

<212> DNA

<213> Homo sapiens

<400> 159

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 gctgactatt tcttcaccgc ctgggtggaag gccatcgctc cgggtgctctt cttcaacgcg 420  
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 35 40 45  
 Asp Gly Leu Asp Gly Ala Tyr Val Ala Val Ala Asn His Ser Ser His  
 50 55 60  
 Leu Asp Ala Pro Leu Val Phe Gly Ala Leu Pro Lys Arg Leu Ser Lys  
 65 70 75 80  
 Tyr Leu Ala Thr Gly Ala Ala Ala Asp Tyr Phe Phe Thr Ala Trp Trp  
 85 90 95  
 Lys Ala Ile Ala Pro Val Leu Phe Phe Asn Ala Phe Pro Val Asp Arg  
 100 105 110  
 Gly Lys Gly Lys Ser Lys Gln Gly Ala Arg Ser Pro Arg Ser His Arg  
 115 120 125  
 Gly Met Ala Gly Ser Leu Leu Thr Asp Gly Val Pro Leu Leu Ile Phe  
 130 135 140  
 Pro Glu Gly Thr Arg Ser Arg Thr Gly Ala Met Gly Thr Phe Lys Pro  
 145 150 155 160  
 Gly Ala Ala Ala Leu Ala Ile Ser Arg Gly Val Pro Val Ile Pro Ile  
 165 170 175  
 Ala Leu Val Gly Ala Trp Ala Ala Met Pro Ser Glu Gln Ala Gly Leu  
 180 185 190  
 Pro Lys Gly Arg Pro Ser Val His Val Ala Ile Gly His Pro Met Asp  
 195 200 205  
 Pro Val Pro Gly Glu Ile Ala His Gln Phe Ser Glu Arg Ile Arg Arg  
 210 215 220



Gln Val Ile Glu Leu His Asp Gln Thr Ala Arg Ala Tyr Gly Met Pro  
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Thr Leu Asp Glu Tyr Gly Arg His Arg Ala Leu Ser Gln Ala Ser Glu  
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Ser Gly Asp Thr Ala Ser Thr Asn His Ser Thr  
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 <211> 1388  
 <212> DNA  
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 agaggaacct cacttaagtg aaataggatc ttgctttctt caaaatcaag agggctttgc 480  
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 <212> PRT  
 <213> Homo sapiens

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 Pro Ser Glu Glu Gln Asp Glu Glu Ala Ser Gln Ser Arg His Arg His  
 35 40 45

Cys Glu Asn Lys Gln Gln Met Arg Thr Asn Val Ile Arg Glu Ile Met  
 50 55 60  
 Asp Thr Glu Arg Val Tyr Ile Lys His Leu Arg Asp Ile Cys Glu Gly  
 65 70 75 80  
 Tyr Ile Arg Gln Cys Arg Lys His Thr Gly Met Phe Thr Val Ala Gln  
 85 90 95  
 Leu Ala Thr Ile Phe Gly Asn Ile Glu Asp Ile Tyr Lys Phe Gln Arg  
 100 105 110  
 Lys Phe Leu Lys Asp Leu Glu Lys Gln Tyr Asn Lys Glu Glu Pro His  
 115 120 125  
 Leu Ser Glu Ile Gly Ser Cys Phe Leu Gln Asn Gln Glu Gly Phe Ala  
 130 135 140  
 Ile Tyr Ser Glu Tyr Cys Asn Asn His Pro Gly Ala Cys Leu Glu Leu  
 145 150 155 160  
 Ala Asn Leu Met Lys Gln Gly Lys Tyr Arg His Phe Phe Glu Ala Cys  
 165 170 175  
 Arg Leu Leu Gln Gln Met Ile Asp Ile Ala Ile Asp Gly Phe Leu Leu  
 180 185 190  
 Thr Pro Val Gln Lys Ile Cys Lys Tyr Pro Leu Gln Leu Ala Glu Leu  
 195 200 205  
 Leu Lys Tyr Thr Thr Gln Glu His Ser Asp Tyr Ser Asn Ile Lys Ala  
 210 215 220  
 Ala Tyr Glu Ala Met Lys Asn Val Ala Cys Leu Ile Asn Glu Arg Lys  
 225 230 235 240  
 Arg Lys Leu Glu Ser Ile Asp Lys Ile Ala Arg Trp Gln Val Ser Ile  
 245 250 255  
 Val Gly Trp Glu Gly Leu Asp Ile Leu Asp Arg Ser Ser Glu Leu Ile  
 260 265 270  
 His Ser Gly Glu Leu Thr Lys Ile Thr Lys Gln Gly Lys Ser Gln Gln  
 275 280 285  
 Arg Thr Phe Phe Leu Phe Asp His Gln Leu Val Ser Cys Lys Lys Asp  
 290 295 300  
 Leu Leu Arg Arg Asp Met Leu Tyr Tyr Lys Gly Arg Leu Asp Met Asp  
 305 310 315 320  
 Glu Met Glu Leu Val Asp Leu Gly Asp Gly Arg Asp Lys Asp Cys Asn  
 325 330 335  
 Leu Ser Val Lys Asn Ala Phe Lys Leu Val Ser Arg Thr Thr Asp Glu  
 340 345 350

Val Tyr Leu Phe Cys Ala Lys Lys Gln Glu Asp Lys Ala Arg Trp Leu  
355 360 365

Gln Ala Cys Ala Asp Glu Arg Arg Arg Val Gln Glu Asp Lys Glu Met  
370 375 380

Gly Met Glu Ile Ser Glu Asn Gln Lys Lys Leu Ala Met Leu Asn Ala  
385 390 395 400

Gln Lys Ala Gly His Gly Lys Ser Lys Gly Lys Leu Trp Arg Arg Leu  
405 410 415

Cys Pro Leu Asn Ala Tyr Gln Tyr Ser Pro Glu Asn Gly Ser Ile Pro  
420 425 430

Gln Val Val Ser Leu  
435

<210> 163  
<211> 1463  
<212> DNA  
<213> Homo sapiens

<400> 163

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| tcgtttcagt | tatgccacc   | ctttcagtgt  | tcatggatgt  | gcccctcgcc | cacaagctag | 120  |
| agggcagctt | gttaaagacc  | tacaaacaag  | atgattaccc  | gaacaagata | ttcttagcct | 180  |
| atagaggcac | cttccacag   | ccccatggag  | tccaggagag  | atttgtttgc | aggctgtctg | 240  |
| cagagctcag | ccctgggggc  | caaaccagg   | catctggagc  | tccctctgtg | gttttcctca | 300  |
| cagtctgcat | gacaaatgaa  | ggccatccct  | gggtttctct  | cgtggtgcag | aagactcgac | 360  |
| tacagatttc | acaggatccc  | tccctgaatt  | atgagtactt  | gcccaccatg | ggcctgaaat | 420  |
| cattcatcca | ggcctctcta  | gcactcctct  | ttggaaagca  | cagccaagcc | attgtggaga | 480  |
| acagggtagg | gggtgtacac  | actgttgggtg | acagtgggtgc | cttccagctt | ggcgtccagt | 540  |
| ttctcagagc | ttggcataag  | gatgctcgta  | tagtttacat  | catctcttct | caaaaagttc | 600  |
| ccacagaact | gcatggactc  | gtcttccagg  | acatgggctt  | tacagtttat | gaatactctg | 660  |
| tctgggacct | caagaagcta  | tgcattggacc | ccgacatact  | cctcaatgtg | gtggagcaga | 720  |
| tcccacatgg | ctgtgtcctt  | gtgatgggga  | acattatcga  | ctgcaagttg | acaccaagtg | 780  |
| ggtgggcaaa | gttgatgtcc  | atgataaaga  | gcaagcagat  | attcccattt | tttgatatct | 840  |
| cctgtcaagg | tttatacacc  | agtgacttgg  | aagaagatac  | tagaatctta | caatactttg | 900  |
| tgtctcaagg | ctttgagttc  | ttctgcagcc  | agtctctgtc  | caaaaatttt | ggcatttatg | 960  |
| atgaaggagt | ggggatgcta  | gtggtggtgg  | cagtcaacaa  | ccagcagctg | ctgtgtgtcc | 1020 |
| tctcccagct | ggaaggatta  | gcccaggccc  | tgtggctaaa  | ccccccaac  | acgggtgcac | 1080 |
| gtgtcatcac | ctccatcctc  | tgcaaccctg  | ctctgctggg  | agaatggaag | cagagtctaa | 1140 |
| aagaagttgt | agagaacatc  | atgctaacca  | aggaaaaagt  | gaaggagaaa | ctccagctcc | 1200 |
| tgggaacccc | tgggtcctgg  | ggtcacatca  | ccgagcagag  | tgggaccac  | ggctatcttg | 1260 |
| gactcaactg | taagcagggtg | gaatacctgg  | tcaggaagaa  | gcacatctat | atccccaa   | 1320 |
| acggtcagat | taacttcagc  | tgtatcaatg  | ccaacaacat  | aaattacatc | actgagggca | 1380 |
| tcaatgaggc | tgtcctcctc  | acagagagct  | cagagatgtg  | tcttccaaag | gaaaaaaaaa | 1440 |
| cactgattgg | aataaaactt  | tag         |             |            |            | 1463 |

<210> 164  
<211> 463  
<212> PRT  
<213> Homo sapiens

<400> 164

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Glu Gly Ser Leu Leu Lys Thr Tyr Lys Gln Asp Asp Tyr Pro Asn Lys  
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Ile Phe Leu Ala Tyr Arg Gly Thr Phe Pro Gln Pro His Gly Val Gln  
35 40 45

Glu Arg Phe Val Cys Arg Leu Ser Ala Glu Leu Ser Pro Gly Gly Pro  
50 55 60

Asn Gln Ala Ser Gly Ala Pro Ser Val Val Phe Leu Thr Val Cys Met  
65 70 75 80

Thr Asn Glu Gly His Pro Trp Val Ser Leu Val Val Gln Lys Thr Arg  
85 90 95

Leu Gln Ile Ser Gln Asp Pro Ser Leu Asn Tyr Glu Tyr Leu Pro Thr  
100 105 110

Met Gly Leu Lys Ser Phe Ile Gln Ala Ser Leu Ala Leu Leu Phe Gly  
115 120 125

Lys His Ser Gln Ala Ile Val Glu Asn Arg Val Gly Gly Val His Thr  
130 135 140

Val Gly Asp Ser Gly Ala Phe Gln Leu Gly Val Gln Phe Leu Arg Ala  
145 150 155 160

Trp His Lys Asp Ala Arg Ile Val Tyr Ile Ile Ser Ser Gln Lys Val  
165 170 175

Pro Thr Glu Leu His Gly Leu Val Phe Gln Asp Met Gly Phe Thr Val  
180 185 190

Tyr Glu Tyr Ser Val Trp Asp Pro Lys Lys Leu Cys Met Asp Pro Asp  
195 200 205

Ile Leu Leu Asn Val Val Glu Gln Ile Pro His Gly Cys Val Leu Val  
210 215 220

Met Gly Asn Ile Ile Asp Cys Lys Leu Thr Pro Ser Gly Trp Ala Lys  
225 230 235 240

Leu Met Ser Met Ile Lys Ser Lys Gln Ile Phe Pro Phe Phe Asp Ile  
245 250 255

Pro Cys Gln Gly Leu Tyr Thr Ser Asp Leu Glu Glu Asp Thr Arg Ile  
260 265 270

Leu Gln Tyr Phe Val Ser Gln Gly Phe Glu Phe Phe Cys Ser Gln Ser  
275 280 285

Leu Ser Lys Asn Phe Gly Ile Tyr Asp Glu Gly Val Gly Met Leu Val

|   |  |     |     |         |
|---|--|-----|-----|---------|
| 290   |  | 295 |     | 300     |
| Val Val Ala Val Asn Asn Gln Gln Leu Leu Cys Val Leu Ser Gln Leu |  |     |     |         |
| 305   |  | 310 |     | 315 320 |
| Glu Gly Leu Ala Gln Ala Leu Trp Leu Asn Pro Pro Asn Thr Gly Ala |  |     |     |         |
|   |  | 325 | 330 | 335     |
| Arg Val Ile Thr Ser Ile Leu Cys Asn Pro Ala Leu Leu Gly Glu Trp |  |     |     |         |
|   |  | 340 | 345 | 350     |
| Lys Gln Ser Leu Lys Glu Val Val Glu Asn Ile Met Leu Thr Lys Glu |  |     |     |         |
|   |  | 355 | 360 | 365     |
| Lys Val Lys Glu Lys Leu Gln Leu Leu Gly Thr Pro Gly Ser Trp Gly |  |     |     |         |
|   |  | 370 | 375 | 380     |
| His Ile Thr Glu Gln Ser Gly Thr His Gly Tyr Leu Gly Leu Asn Cys |  |     |     |         |
| 385   |  | 390 | 395 | 400     |
| Lys Gln Val Glu Tyr Leu Val Arg Lys Lys His Ile Tyr Ile Pro Lys |  |     |     |         |
|   |  | 405 | 410 | 415     |
| Asn Gly Gln Ile Asn Phe Ser Cys Ile Asn Ala Asn Asn Ile Asn Tyr |  |     |     |         |
|   |  | 420 | 425 | 430     |
| Ile Thr Glu Gly Ile Asn Glu Ala Val Leu Leu Thr Glu Ser Ser Glu |  |     |     |         |
|   |  | 435 | 440 | 445     |
| Met Cys Leu Pro Lys Glu Lys Lys Thr Leu Ile Gly Ile Lys Leu     |  |     |     |         |
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<210> 165

<211> 1280

<212> DNA

<213> Homo sapiens

<400> 165

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<210> 166  
 <211> 421  
 <212> PRT  
 <213> Homo sapiens

<400> 166  
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 Ser Leu Asn Tyr Glu Tyr Leu Pro Thr Met Gly Leu Lys Ser Phe Ile  
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 Gln Ala Ser Leu Ala Leu Leu Phe Gly Lys His Ser Gln Ala Ile Val  
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 Glu Asn Arg Ala Gly Gly Val His Thr Val Gly Asp Ser Gly Ala Phe  
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 Gln Leu Gly Val Gln Phe Leu Arg Ala Trp His Lys Asp Ala Arg Ile  
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 Val Tyr Ile Ile Ser Ser Gln Lys Glu Leu His Gly Leu Val Phe Gln  
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 Asp Met Gly Phe Thr Val Tyr Glu Tyr Ser Val Trp Asp Pro Lys Lys  
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 His Gly Cys Val Leu Val Met Gly Asn Ile Ile Asp Cys Lys Leu Thr  
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Phe Phe Cys Ser Gln Ser Leu Ser Lys Asn Phe Gly Ile Tyr Asp Glu  
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Gly Val Gly Met Leu Val Val Val Ala Val Asn Asn Gln Gln Leu Leu  
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<211> 4915

<212> DNA

<213> Homo sapiens

<400> 167

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| ttatctcaga | gcagctgcag | cagctgcac   | tcggcaaccg  | ctcgcgcaa   | gcctcccgag  | 1080 |
| ccccccgct  | catccccg   | gcctcactcg  | gtagcccagg  | cccttaccgg  | gacacttccg  | 1140 |
| cggctcaaaa | gcccacagcc | aatcggagcg  | ggcgacttcg  | gcgtgagacc  | ccgcccctgg  | 1200 |
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| ttgactatga | agtgcgcagg | acgttcaaca  | atgacatgct  | cctggccttc  | atcagcagca  | 1980 |
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<212> PRT

<213> Homo sapiens

<400> 168

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Met Leu Ala Ser His Ile Pro Ala Gln Pro Gln Gly Thr Ser Leu Lys
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Ser Pro His Ala Leu Arg Asn Glu Pro Arg Thr Pro Thr Leu Thr Arg
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Pro Arg Cys Ile Asn Ala Leu Thr Cys Thr Ala Ser Pro Cys Gly Pro
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Thr Phe Arg Leu Gln His Ser Leu Asp Ala Ser Pro Arg Pro Ala Cys
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Leu Val Thr Val Ala Pro Asp Pro Ala Ser Phe Ala Ala Pro Arg Ser
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Phe Pro Leu Arg Leu Pro Arg Gly Asp Glu Ser Ala Gln Arg Gly Gly
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Arg Arg Pro Pro Thr Leu Cys Ala Leu Ser Pro Ala Pro Ala Ala Gln
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Pro Ser Pro Val Arg Pro Ala Glu Thr Met Asp Thr Glu Asp Asp Pro
      165            170            175

Leu Leu Gln Asp Val Trp Leu Glu Glu Glu Gln Glu Glu Glu Ala
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Thr Gly Glu Thr Phe Leu Gly Ala Gln Lys Pro Gly Pro Gln Pro Gly
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 Gly Ser Tyr Ser Tyr Cys Ser Pro Pro Ser Ser Leu Met Thr Tyr Phe  
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Glu Phe Tyr Trp Tyr Val Asp Glu Gly Leu Ser Ala Asp Asn Leu Lys  
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Thr Ser Leu Thr Thr Ala Ala Ala Tyr Ala Ala Asn Val Phe Ser Gln  
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785 790 795 800  
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Phe Ala Thr Pro Glu Gln Val Gly Gly Ser Pro Ala Gln Ala Pro Ile  
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Pro Tyr Leu Asp Asp Asp Ile Pro Leu Leu Glu Val Glu Glu Glu Pro  
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Gly Leu Gln Pro Ala Ser Asn Thr Gly Ser Arg Gly His Leu Ile Val  
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Gln Leu Gln Glu Leu Leu His His Trp Val Leu Trp Ser Ala Val Lys  
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Phe Arg Pro Asp Thr Asn Ile Gln Val Leu Leu Asp Leu Lys Tyr Asn  
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Leu Gln Asp Phe Pro Gly Thr Val Tyr Ile Ser Lys Val Lys Ser Gln  
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<212> DNA

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<400> 169

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<212> PRT
<213> Homo sapiens

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Gly Met Gln Leu Leu Val Phe Pro Arg Pro Gly Gln Thr Leu Pro Phe
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Lys Val Val Asp Glu Phe Gly Asn Arg Phe Asp Val Asn Asn Cys Ser
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Ile Cys Tyr His Trp Val Thr Ser Arg Pro Gln Glu Pro Ala Val Phe
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Ser Ala Asp Tyr Arg Gly Cys His Val Leu Glu Lys Asp Gly Arg Phe
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His Leu Arg Val Phe Met Glu Ala Val Leu Pro Asn Gly Arg Val Asp
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| Lys | Arg | Asp | Tyr | Ile | Gly | Thr | His | Leu | Ser | Gln | Glu | Gln | Cys | Gln | Val |
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| Ala | Ser | Gly | His | Leu | Pro | Cys | Ile | Val | Arg | Arg | Thr | Ser | Lys | Glu | Ala |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Cys | Gln | Gln | Ala | Gly | Cys | Cys | Tyr | Asp | Asn | Thr | Arg | Glu | Val | Pro | Cys |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Tyr | Tyr | Gly | Asn | Thr | Ala | Thr | Val | Gln | Cys | Phe | Arg | Asp | Gly | Tyr | Phe |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Val | Leu | Val | Val | Ser | Gln | Glu | Met | Ala | Leu | Thr | His | Arg | Ile | Thr | Leu |
|     | 275 |     |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Ala | Asn | Ile | His | Leu | Ala | Tyr | Ala | Pro | Thr | Ser | Cys | Ser | Pro | Thr | Gln |
| 290 |     |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |
| His | Thr | Glu | Ala | Phe | Val | Val | Phe | Tyr | Phe | Pro | Leu | Thr | His | Cys | Gly |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |
| Thr | Thr | Met | Gln | Val | Ala | Gly | Asp | Gln | Leu | Ile | Tyr | Glu | Asn | Trp | Leu |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |
| Val | Ser | Gly | Ile | His | Ile | Gln | Lys | Gly | Pro | Gln | Gly | Ser | Ile | Thr | Arg |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |
| Asp | Ser | Thr | Phe | Gln | Leu | His | Val | Arg | Cys | Val | Phe | Asn | Ala | Ser | Asp |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |
| Phe | Leu | Pro | Ile | Gln | Ala | Ser | Ile | Phe | Pro | Pro | Pro | Ser | Pro | Ala | Pro |
| 370 |     |     |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |
| Met | Thr | Gln | Pro | Gly | Pro | Leu | Arg | Leu | Glu | Leu | Arg | Ile | Ala | Lys | Asp |
| 385 |     |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     | 400 |
| Glu | Thr | Cys | Ser | Ser | Tyr | Tyr | Gly | Glu | Asp | Asp | Tyr | Pro | Ile | Val | Arg |
|     |     |     |     | 405 |     |     |     |     | 410 |     |     |     |     | 415 |     |
| Leu | Leu | Arg | Glu | Pro | Val | His | Val | Glu | Val | Arg | Leu | Leu | Gln | Arg | Thr |
|     |     |     | 420 |     |     |     |     | 425 |     |     |     |     | 430 |     |     |
| Asp | Pro | Asn | Leu | Val | Leu | Leu | Leu | His | Gln | Cys | Trp | Gly | Ala | Pro | Ser |
|     |     | 435 |     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |
| Ala | Asn | Pro | Phe | Gln | Gln | Pro | Gln | Trp | Pro | Ile | Leu | Ser | Asp | Gly | Cys |
| 450 |     |     |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     |
| Pro | Phe | Lys | Gly | Asp | Ser | Tyr | Arg | Thr | Gln | Met | Val | Ala | Leu | Asp | Gly |
| 465 |     |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |
| Ala | Thr | Pro | Phe | Gln | Ser | His | Tyr | Gln | Arg | Phe | Thr | Val | Ala | Thr | Phe |
|     |     |     |     | 485 |     |     |     |     | 490 |     |     |     |     | 495 |     |
| Ala | Leu | Leu | Asp | Ser | Gly | Ser | Gln | Arg | Ala | Leu | Arg | Gly | Leu | Val | Tyr |



|   |     |     |
|---|-----|-----|
| 500   | 505 | 510 |
| Leu Phe Cys Ser Thr Ser Ala Cys His Thr Ser Gly Leu Glu Thr Cys |     |     |
| 515   | 520 | 525 |
| Ser Thr Ala Cys Ser Thr Gly Thr Thr Arg Gln Arg Arg Ser Ser Gly |     |     |
| 530   | 535 | 540 |
| His Arg Asn Asp Thr Ala Arg Pro Gln Asp Ile Val Ser Ser Pro Gly |     |     |
| 545   | 550 | 555 |
| Pro Val Gly Phe Glu Asp Ser Tyr Gly Gln Glu Pro Thr Leu Gly Pro |     |     |
| 565   | 570 | 575 |
| Thr Asp Ser Asn Gly Asn Ser Ser Leu Arg Pro Leu Leu Trp Ala Val |     |     |
| 580   | 585 | 590 |
| Leu Leu Leu Pro Ala Val Ala Leu Val Leu Gly Phe Gly Val Phe Val |     |     |
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<211> 6108

<212> DNA

<213> Homo sapiens

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 <211> 567  
 <212> PRT  
 <213> Homo sapiens

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|     |     |     | 195 |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Ile | Ala | Asp | Ile | His | Cys | Met | Ile | Ala | Ala | Gly | Gln | Asp | Leu | Asp | Trp |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Ile | Asp | Ala | Gln | Gly | Ala | Thr | Leu | Leu | His | Ile | Ala | Gly | Ala | Asn | Gly |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Tyr | Leu | Arg | Ala | Ala | Glu | Leu | Leu | Leu | Asp | His | Gly | Val | Arg | Val | Asp |
|     |     |     | 245 |     |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Val | Lys | Asp | Trp | Asp | Gly | Trp | Glu | Pro | Leu | His | Ala | Ala | Ala | Phe | Trp |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Gly | Gln | Met | Gln | Met | Ala | Glu | Leu | Leu | Val | Ser | His | Gly | Ala | Ser | Leu |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Ser | Ala | Arg | Thr | Ser | Met | Asp | Glu | Met | Pro | Ile | Asp | Leu | Cys | Glu | Glu |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |
| Glu | Glu | Phe | Lys | Val | Leu | Leu | Leu | Glu | Leu | Lys | His | Lys | His | Asp | Val |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |
| Ile | Met | Lys | Ser | Gln | Leu | Arg | His | Lys | Ser | Ser | Leu | Ser | Arg | Arg | Thr |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |
| Ser | Ser | Ala | Gly | Ser | Arg | Gly | Lys | Val | Val | Arg | Arg | Ala | Ser | Leu | Ser |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |
| Asp | Arg | Thr | Asn | Leu | Tyr | Arg | Lys | Glu | Tyr | Glu | Gly | Glu | Ala | Ile | Leu |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |
| Trp | Gln | Arg | Ser | Ala | Ala | Glu | Asp | Gln | Arg | Thr | Ser | Thr | Tyr | Asn | Gly |
|     | 370 |     |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |
| Asp | Ile | Arg | Glu | Thr | Arg | Thr | Asp | Gln | Glu | Asn | Lys | Asp | Pro | Asn | Pro |
| 385 |     |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     | 400 |
| Arg | Leu | Glu | Lys | Pro | Val | Leu | Leu | Ser | Glu | Phe | Pro | Thr | Lys | Ile | Pro |
|     |     |     | 405 |     |     |     |     |     | 410 |     |     |     |     | 415 |     |
| Arg | Gly | Glu | Leu | Asp | Met | Pro | Val | Glu | Asn | Gly | Leu | Arg | Ala | Pro | Val |
|     |     |     | 420 |     |     |     |     | 425 |     |     |     |     | 430 |     |     |
| Ser | Ala | Tyr | Gln | Tyr | Ala | Leu | Ala | Asn | Gly | Asp | Val | Trp | Lys | Val | His |
|     | 435 |     |     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |
| Glu | Val | Pro | Asp | Tyr | Ser | Met | Ala | Tyr | Gly | Asn | Pro | Gly | Val | Ala | Asp |

450                      455                      460  
 Ala Thr Pro Pro Trp Ser Ser Tyr Lys Glu Gln Ser Pro Gln Thr Leu  
 465                      470                      475                      480  
 Leu Glu Leu Lys Arg Gln Arg Ala Ala Ala Lys Leu Leu Ser His Pro  
                                  485                      490                      495  
 Phe Leu Ser Thr His Leu Gly Ser Ser Met Ala Arg Thr Gly Glu Ser  
                                  500                      505                      510  
 Ser Ser Glu Gly Lys Ala Pro Leu Ile Gly Gly Arg Thr Ser Pro Tyr  
                                  515                      520                      525  
 Ser Ser Asn Gly Thr Ser Val Tyr Tyr Thr Val Thr Ser Gly Asp Pro  
                                  530                      535                      540  
 Pro Leu Leu Lys Phe Lys Ala Pro Ile Glu Glu Met Glu Glu Lys Val  
 545                      550                      555                      560  
 His Gly Cys Cys Arg Ile Ser  
                                  565

<210> 173  
 <211> 1011  
 <212> DNA  
 <213> Homo sapiens

<400> 173  
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 ctcccttgat tcacagggca gcctcagctt cagatgatga tctctggggg tgtctttttc 120  
 ttctacacta ttgccttcat gggaaatatg gccatcatcc tattgtcttt cctagatgac 180  
 catctccaag tccccatgta cttcttcctt agaaatttgg ccatcttgga tctctgttat 240  
 accacaaata tagtcccaca aatgttggtc agtatctggg gcaaagacaa aagaattacc 300  
 tttgggtggg gtgcctttca acttttcatt gatgtggcac tgtactcagt tgaatgcac 360  
 cttctgtcca tgatgtcata tgatcgactc aatgctatct gcaagcctct gcatcatatg 420  
 accataatga acctccaact ctgccagggc cttgtgggtca tctcctgggt agttgggtgtg 480  
 attaattgca tcataccttc cccttatgcc acgagtcttc ctcgatgtag gaaccaccac 540  
 ctagaccact tttttgtgtg tgtgaaatgt ctgcaaagat caagattcaa gattgcatgt 600  
 gtggacacca cagccatgga ggtaaccaca tttgccatgt gcctgattat agttcttgtt 660  
 cctcttcttc ttattcttgt gtcatatggg ttcattgctg tggctgtact caagatcaag 720  
 tctgcagcag gaagacaaaa agcatttggg acctgttctt cccatctcgt tgtgggtatcc 780  
 atcttctgtg ggacagttac atacatgtat atacagccag gaaacagtcc aaatcagaat 840  
 gagggcaaac ttctcagtat attttactcc attgttactc ccagcttgaa cccattaatt 900  
 tatacggtaa ggaataagga gttcaagggg gccatgaaga ggctaactgg aaaagaaaaa 960  
 gattgcatgg aaaaaagagg acattgattc ttcctccag caatttctaa t 1011

<210> 174  
 <211> 319  
 <212> PRT  
 <213> Homo sapiens

<400> 174  
 Met Ile Asn Asp Ser His Phe Ser Gly Phe Ile Leu Leu Gly Phe Thr  
 1                      5                      10                      15

Gly Gln Pro Gln Leu Gln Met Met Ile Ser Gly Val Val Phe Phe Phe  
                   20                                  25                                  30  
 Tyr Thr Ile Ala Phe Met Gly Asn Met Ala Ile Ile Leu Leu Ser Phe  
                   35                                  40                                  45  
 Leu Asp Asp His Leu Gln Val Pro Met Tyr Phe Phe Leu Arg Asn Leu  
                   50                                  55                                  60  
 Ala Ile Leu Asp Leu Cys Tyr Thr Thr Asn Ile Val Pro Gln Met Leu  
                   65                                  70                                  75                                  80  
 Val Ser Ile Trp Gly Lys Asp Lys Arg Ile Thr Phe Gly Gly Cys Ala  
                                   85                                  90                                  95  
 Phe Gln Leu Phe Ile Asp Val Ala Leu Tyr Ser Val Glu Cys Ile Leu  
                                   100                                  105                                  110  
 Leu Ser Met Met Ser Tyr Asp Arg Leu Asn Ala Ile Cys Lys Pro Leu  
                   115                                  120                                  125  
 His His Met Thr Ile Met Asn Leu Gln Leu Cys Gln Gly Leu Val Val  
                   130                                  135                                  140  
 Ile Ser Trp Val Val Gly Val Ile Asn Cys Ile Ile Pro Ser Pro Tyr  
                   145                                  150                                  155                                  160  
 Ala Thr Ser Leu Pro Arg Cys Arg Asn His His Leu Asp His Phe Phe  
                                   165                                  170                                  175  
 Val Cys Val Lys Cys Leu Gln Arg Ser Arg Phe Lys Ile Ala Cys Val  
                                   180                                  185                                  190  
 Asp Thr Thr Ala Met Glu Val Thr Thr Phe Ala Met Cys Leu Ile Ile  
                   195                                  200                                  205  
 Val Leu Val Pro Leu Leu Leu Ile Leu Val Ser Tyr Gly Phe Ile Ala  
                   210                                  215                                  220  
 Val Ala Val Leu Lys Ile Lys Ser Ala Ala Gly Arg Gln Lys Ala Phe  
                   225                                  230                                  235                                  240  
 Gly Thr Cys Ser Ser His Leu Val Val Val Ser Ile Phe Cys Gly Thr  
                                   245                                  250                                  255  
 Val Thr Tyr Met Tyr Ile Gln Pro Gly Asn Ser Pro Asn Gln Asn Glu  
                   260                                  265                                  270  
 Gly Lys Leu Leu Ser Ile Phe Tyr Ser Ile Val Thr Pro Ser Leu Asn  
                   275                                  280                                  285  
 Pro Leu Ile Tyr Thr Val Arg Asn Lys Glu Phe Lys Gly Ala Met Lys  
                   290                                  295                                  300  
 Arg Leu Thr Gly Lys Glu Lys Asp Cys Met Glu Lys Arg Gly His  
                   305                                  310                                  315

<210> 175  
 <211> 1008  
 <212> DNA  
 <213> Homo sapiens

<400> 175  
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 atgctccttg gggtcccttg gaagcctcag ctggagatga tcatctctgg gggtgtcttt 120  
 ttcttctatg caatttcttt gatgggaaat atggtcctta tcctgctgcc attactggat 180  
 aaacatctcc aaaccccat atatttcttt cttagaaatc tggctatctt ggatctttgt 240  
 tacaccacaa atatagtccc acagatgttg gtcaatgcct ggggtaaaga caagaaaatc 300  
 acttttgggtg gctgtgcttt tcaacttttc actaatgtga cgctatgcac ggttgaatgt 360  
 atgcttcttg ctgtgatgtc atatgaccca ttcaatgctg tctgcaagcc tctggactat 420  
 atgaccataa tgaaccccca actctgtcaa ggcctgggtg ccatgacctg gttaattggg 480  
 gtcactaatt gcatgatact ttccccctgt cctgtgagtc ttccctcgat cggagaccac 540  
 cacctggatc actatttttg tgaaatatct gcaatgggtc aaattgcatg tggggctacc 600  
 acagtcattg agttgcattg tgttgttgtt gttgttttca ttttccttgc atcacttctt 660  
 ctcatctctg tgctcatatg cttcattgct gtggctgtac tcaagatcaa gtctgcagca 720  
 ggaagacaaa aagcatttgg gacctgtttc tcccatctca ttgtggtatc catcttctat 780  
 gggactgtta gatatatgta tatagagcca ggaaacagtc catctcagga tgagggcaaa 840  
 cttctccata tattttactc cattgttact cccaccttga acccaatccc actaagggaat 900  
 aaggagttca agtgggccat gaaaaggcct attggaaaag aaaaagggtt tggagacaca 960  
 ataggtcact aacatctttt tacaagaaat tcctggccgg gcacggtg 1008

<210> 176  
 <211> 313  
 <212> PRT  
 <213> Homo sapiens

<400> 176  
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 1 5 10 15  
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 20 25 30  
 Tyr Ala Ile Ser Leu Met Gly Asn Met Val Leu Ile Leu Leu Pro Leu  
 35 40 45  
 Leu Asp Lys His Leu Gln Thr Pro Ile Tyr Phe Phe Leu Arg Asn Leu  
 50 55 60  
 Ala Ile Leu Asp Leu Cys Tyr Thr Thr Asn Ile Val Pro Gln Met Leu  
 65 70 75 80  
 Val Asn Ala Trp Gly Lys Asp Lys Lys Ile Thr Phe Gly Gly Cys Ala  
 85 90 95  
 Phe Gln Leu Phe Thr Asn Val Thr Leu Cys Thr Val Glu Cys Met Leu  
 100 105 110  
 Leu Ala Val Met Ser Tyr Asp Pro Phe Asn Ala Val Cys Lys Pro Leu  
 115 120 125

Asp Tyr Met Thr Ile Met Asn Pro Gln Leu Cys Gln Gly Leu Val Ala  
 130 135 140  
 Met Thr Trp Leu Ile Gly Val Thr Asn Cys Met Ile Leu Ser Pro Cys  
 145 150 155 160  
 Pro Val Ser Leu Pro Arg Cys Gly Asp His His Leu Asp His Tyr Phe  
 165 170 175  
 Cys Glu Ile Ser Ala Met Val Lys Ile Ala Cys Gly Ala Thr Thr Val  
 180 185 190  
 Met Glu Leu His Cys Val Val Val Val Phe Ile Phe Leu Ala Ser  
 195 200 205  
 Leu Leu Leu Ile Leu Val Ser Tyr Gly Phe Ile Ala Val Ala Val Leu  
 210 215 220  
 Lys Ile Lys Ser Ala Ala Gly Arg Gln Lys Ala Phe Gly Thr Cys Phe  
 225 230 235 240  
 Ser His Leu Ile Val Val Ser Ile Phe Tyr Gly Thr Val Arg Tyr Met  
 245 250 255  
 Tyr Ile Glu Pro Gly Asn Ser Pro Ser Gln Asp Glu Gly Lys Leu Leu  
 260 265 270  
 His Ile Phe Tyr Ser Ile Val Thr Pro Thr Leu Asn Pro Ile Pro Leu  
 275 280 285  
 Arg Asn Lys Glu Phe Lys Trp Ala Met Lys Arg Leu Ile Gly Lys Glu  
 290 295 300  
 Lys Gly Ser Gly Asp Thr Ile Gly His  
 305 310

<210> 177

<211> 1050

<212> DNA

<213> Homo sapiens

<400> 177

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acttttttaa gattgatatt ttgcccaatg gccaacacat tatcctccct gaattcttgt 60
aatgtgtttc tcctagttct gaacagggtg atgggcatga ccaacagcag tgtcaaggga 120
gacttcatcc tgggtgggtt ctctcatcag cccacctgg aaaagatcct ctttgtggct 180
gttttgatat cctatctcct tacccttggt ggaaatacag taattattct gatctgctct 240
gtagacccta aactcaagac acccatgtat tttttcttaa ctcacctctc ctagttgat 300
atctgtttta ccaccagtat tgtcccccag ctgctgtgga acctaaaagg acctgacaaa 360
acaatcacat tcctgggttg tgtcatccag ctctacatct ccctggcatt gggctccact 420
gagtgtgtcc tcctggctgt aatggctttt gatcgctatg ctgcagtttg caaacctctc 480
cactataccg ccgtaatgaa ccctcagctg tgccaggctc tggcaggggt tgcgtggctg 540
agtggagtgg gaaacactct tatccagggc actgtcacc tctggcttcc tcgctgtgga 600
caccgattgc tccaacattt tcttcgtgag gtaccctcca tgattaagct tgcattgtgtg 660
gacatccatg ataatgaggt tcagctcttt gttgcttcac tgggtcttgc cctcttgccc 720
ttagtgttaa tactgtgtc ctatggacat atagccaagg tggtcataag gatcaagtca 780
gtccaggcct ggtgcaaagg cctggggaca tgtggatccc atttgatagt agtgtccctc 840

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ttctgtggga ccatacacagc tgtctacatc cagtccaaca gttcttatgc ccatagctcat 900  
 gggaagttca tctccctctt ctatacagtt gtgaccccgga cccatcaatcc tctcatctac 960  
 acactgagga ataatgacgt gaaaggagca ctgcgattat ttaacagaga cttaggcaca 1020  
 taaaaaatga agcagagtac acagcgctca 1050

<210> 178  
 <211> 331  
 <212> PRT  
 <213> Homo sapiens

<400> 178  
 Met Ala Asn Thr Leu Ser Ser Leu Asn Ser Cys Asn Val Phe Leu Leu  
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 Val Leu Asn Arg Val Met Gly Met Thr Asn Ser Ser Val Lys Gly Asp  
 20 25 30  
 Phe Ile Leu Val Gly Phe Ser His Gln Pro His Leu Glu Lys Ile Leu  
 35 40 45  
 Phe Val Ala Val Leu Ile Ser Tyr Leu Leu Thr Leu Val Gly Asn Thr  
 50 55 60  
 Val Ile Ile Leu Ile Cys Ser Val Asp Pro Lys Leu Lys Thr Pro Met  
 65 70 75 80  
 Tyr Phe Phe Leu Thr His Leu Ser Leu Val Asp Ile Cys Phe Thr Thr  
 85 90 95  
 Ser Ile Val Pro Gln Leu Leu Trp Asn Leu Lys Gly Pro Asp Lys Thr  
 100 105 110  
 Ile Thr Phe Leu Gly Cys Val Ile Gln Leu Tyr Ile Ser Leu Ala Leu  
 115 120 125  
 Gly Ser Thr Glu Cys Val Leu Leu Ala Val Met Ala Phe Asp Arg Tyr  
 130 135 140  
 Ala Ala Val Cys Lys Pro Leu His Tyr Thr Ala Val Met Asn Pro Gln  
 145 150 155 160  
 Leu Cys Gln Ala Leu Ala Gly Val Ala Trp Leu Ser Gly Val Gly Asn  
 165 170 175  
 Thr Leu Ile Gln Gly Thr Val Thr Leu Trp Leu Pro Arg Cys Gly His  
 180 185 190  
 Arg Leu Leu Gln His Phe Leu Arg Glu Val Pro Ser Met Ile Lys Leu  
 195 200 205  
 Ala Cys Val Asp Ile His Asp Asn Glu Val Gln Leu Phe Val Ala Ser  
 210 215 220  
 Leu Val Leu Leu Leu Leu Pro Leu Val Leu Ile Leu Leu Ser Tyr Gly  
 225 230 235 240



Phe Ile Leu Leu Gly Phe Ser Asp Arg Pro Trp Leu Glu Thr Pro Leu  
35 40 45  
Cys Val Ile Phe Leu Val Ala Tyr Ile Phe Ser Leu Phe Gly Asn Ile  
50 55 60  
Ser Ile Ile Leu Val Ser His Leu Asp Pro Gln Leu Asp Ser Pro Met  
65 70 75 80  
Tyr Phe Phe Val Ser Asn Leu Ser Phe Leu Asp Leu Cys Tyr Thr Thr  
85 90 95  
Ser Thr Val Pro Gln Met Leu Val Asn Leu Arg Gly Pro Glu Lys Thr  
100 105 110  
Ile Ser Tyr Gly Gly Cys Val Ala Gln Leu Tyr Ile Phe Leu Ala Leu  
115 120 125  
Gly Ser Thr Glu Cys Ile Leu Leu Ala Ile Met Ala Phe Asp Arg Tyr  
130 135 140  
Ala Ala Ile Cys Lys Pro Leu His Tyr Pro Val Ile Met Asn His Arg  
145 150 155 160  
Arg Cys Ile His Met Ala Ala Gly Thr Trp Ile Ser Gly Phe Ala Asn  
165 170 175  
Ser Leu Val Gln Ser Thr Leu Thr Val Val Ala Pro Arg Cys Gly Gln  
180 185 190  
Arg Val Leu Asp His Phe Phe Cys Glu Val Pro Ala Leu Leu Lys Leu  
195 200 205  
Ala Cys Ile Asp Ile Arg Val Asn Glu Met Glu Leu Asn Val Leu Gly  
210 215 220  
Ala Leu Leu Leu Leu Met Pro Leu Thr Leu Ile Leu Gly Thr Tyr Val  
225 230 235 240  
Phe Ile Ala Gln Ala Val Met Arg Ile Cys Ser Ala Glu Ser Arg Trp  
245 250 255  
Lys Ala Phe Asn Thr Cys Ala Ser His Leu Leu Val Val Ser Leu Phe  
260 265 270  
Tyr Phe Thr Ala Ile Ser Met Tyr Val Gln Pro Pro Ser Ser Tyr Ser  
275 280 285  
His Asp Arg Gly Lys Ile Ile Met Ala Leu Phe Tyr Gly Ile Val Thr  
290 295 300  
Pro Thr Leu Asn Pro Phe Ile Tyr Thr Leu Arg Asn Lys Asp Val Lys  
305 310 315 320  
Ala Ala Leu Arg Arg Ser Leu Thr Lys Glu Phe Trp Ile Lys Thr Arg  
325 330 335

<210> 181  
 <211> 1014  
 <212> DNA  
 <213> Homo sapiens

<400> 181  
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 ctgatcctgg ccatgtatct ggtgactatt ttaggaaaca ccctcattct tcttctgac 180  
 agactggaca acaggcttca taccctcatg tacttctccc ttagtggttct gtcattttgtg 240  
 gacttttggt atacaaagag tattgtccca caaatgctgt cccacttget ctcagcccca 300  
 aagtccatcc cattctacag ttgtgtgctc cagctctatg tttctctggc attgtgtggg 360  
 tctgagttct tcctgctggg ggccatggcc tatgaccgt acgtggccgt gtgccacca 420  
 ctgcactaca cggatcatcat gcatggaggg ctgtgcctgg ggctggcggc cagccgcctg 480  
 gtggctggct tctcaaattc cctgatggaa acaattatca ccttccagct tttatcacct 540  
 tccagcttcc tgtgtcacgg tggttatcaat cactttgtct gtgagacctt agcagtgtgta 600  
 cagctagcct gtgtggatgt ccccttcaac aaggctcatg tggccatctc aggggtttctg 660  
 gtgatcttgc ttccctgttc cctggttcta ttctcctatg cttgcatagt tgccaccatt 720  
 ttgtgcattc gttctacca ggtacgctgc aaagcctttg ggacctgtgc ctctcacctc 780  
 attgtggttt gcatgtgctt tggggctacc atctgcacct acctggggcc acagtgggcc 840  
 tcctcagcag aggaagagaa gatgattgct ctcttctatg gagtgggtgc acccatgttg 900  
 aacccttga tctacagctt gaggaataag gaagttacgg ctgctgtccg gaaagtttta 960  
 gaaagatgca gataaagggt caagactcta agaacctctt gttatctatc atca 1014

<210> 182  
 <211> 315  
 <212> PRT  
 <213> Homo sapiens

<400> 182  
 Met Gly Gln Glu Asn Lys Asn Gln Thr Trp Val Ser Glu Phe Ile Leu  
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 Leu Gly Ile Ser Ser Asp Trp Gly Ile Gln Val Ser Leu Phe Ala Leu  
 20 25 30  
 Ile Leu Ala Met Tyr Leu Val Thr Ile Leu Gly Asn Thr Leu Ile Leu  
 35 40 45  
 Leu Leu Ile Arg Leu Asp Asn Arg Leu His Thr Pro Met Tyr Phe Ser  
 50 55 60  
 Leu Ser Val Leu Ser Phe Val Asp Phe Cys Tyr Thr Lys Ser Ile Val  
 65 70 75 80  
 Pro Gln Met Leu Ser His Leu Leu Ser Ala Arg Lys Ser Ile Pro Phe  
 85 90 95  
 Tyr Ser Cys Val Leu Gln Leu Tyr Val Ser Leu Ala Leu Cys Gly Ser  
 100 105 110  
 Glu Phe Phe Leu Leu Gly Ala Met Ala Tyr Asp Arg Tyr Val Ala Val

|   |     |     |
|---|-----|-----|
| 115   | 120 | 125 |
| Cys His Pro Leu His Tyr Thr Val Ile Met His Gly Gly Leu Cys Leu |     |     |
| 130   | 135 | 140 |
| Gly Leu Ala Ala Ser Arg Leu Val Ala Gly Phe Ser Asn Ser Leu Met |     |     |
| 145   | 150 | 155 |
| Glu Thr Ile Ile Thr Phe Gln Leu Leu Ser Pro Ser Ser Phe Leu Cys |     |     |
|   | 165 | 170 |
| His Gly Val Ile Asn His Phe Val Cys Glu Thr Leu Ala Val Leu Gln |     |     |
|   | 180 | 185 |
| Leu Ala Cys Val Asp Val Pro Phe Asn Lys Val Met Val Ala Ile Ser |     |     |
|   | 195 | 200 |
| Gly Phe Leu Val Ile Leu Leu Pro Cys Ser Leu Val Leu Phe Ser Tyr |     |     |
|   | 210 | 215 |
| Ala Cys Ile Val Ala Thr Ile Leu Cys Ile Arg Ser Thr Gln Val Arg |     |     |
|   | 225 | 230 |
| Cys Lys Ala Phe Gly Thr Cys Ala Ser His Leu Ile Val Val Cys Met |     |     |
|   | 245 | 250 |
| Cys Phe Gly Ala Thr Ile Cys Thr Tyr Leu Gly Pro Gln Leu Ala Ser |     |     |
|   | 260 | 265 |
| Ser Ala Glu Glu Glu Lys Met Ile Ala Leu Phe Tyr Gly Val Val Ser |     |     |
|   | 275 | 280 |
| Pro Met Leu Asn Pro Leu Ile Tyr Ser Leu Arg Asn Lys Glu Val Thr |     |     |
|   | 290 | 295 |
| Ala Ala Val Arg Lys Val Leu Glu Arg Cys Arg                     |     |     |
|   | 305 | 310 |
|   |     | 315 |

<210> 183

<211> 1151

<212> DNA

<213> Homo sapiens

<400> 183

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ctttaggttt tccgaaggtc aacaatgaaa aacagaacca tgtttggtga gtttattcta 180
ctgggcctta caaatcaacc tgaactccaa gtgatgatat tcatctttct gttcctcacc 240
tacatgctaa gtgtcctagg aaatctgact attatcacc tcaccttact agacccccac 300
ctccagaccc ccatgtattt cttcctccgg aattttctct tcttagaaat ttccttcaca 360
tccattttta ttcccagatt tctgaccagc atgacaacag gaaataaagt tatcagcttt 420
gtggctgct tgactcagta tttttttgct atattttctg gagctaccga gttttacctc 480
ctggcctcca tgtcttatga tcgttatgtg gccatctgca aacccttgca ttacctgact 540
attatgagca gcagagtctg catacaacta gtgttctgct cctgggttggg gggattccta 600
gcaatcttac caccaatcat cctgatgacc caggtagatt tctgtgtctc caacattctg 660
aatcactatt actgtgacta tgggcctctc gtggagcttg cctgctcaga cacaagcctc 720

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ttagaactga tgggtcatcct cttggccggt gtgactctca tgggttactct ggtgctgggtg 780
acactttctt acacatacat tatcaggact attctgagga tcccttccgc ccagcaaagg 840
acaaaggcct tttccacttg ttctcccccac atgattgtca tctccctctc ttatggcagc 900
tgcatgttta tgtacattaa tcctttctgca aaagaaggag gtgctttcaa caaaggaata 960
gctgtactca ttacttcggt tactccctta ctgaatccct tcatatatac ttaagaaat 1020
cagcaagtga aacaagcttt caaggactca gtcaaaaaga ttgtgaaact ttaaaaaagg 1080
agattacact tcaaaatata ttttactta acaaatatgc attgaatgac tatatttcaa 1140
gtgctaaatt g 1151

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<210> 184  
 <211> 309  
 <212> PRT  
 <213> Homo sapiens

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<400> 184
Met Lys Asn Arg Thr Met Phe Gly Glu Phe Ile Leu Leu Gly Leu Thr
  1             5             10             15

Asn Gln Pro Glu Leu Gln Val Met Ile Phe Ile Phe Leu Phe Leu Thr
      20             25             30

Tyr Met Leu Ser Val Leu Gly Asn Leu Thr Ile Ile Thr Leu Thr Leu
      35             40             45

Leu Asp Pro His Leu Gln Thr Pro Met Tyr Phe Phe Leu Arg Asn Phe
      50             55             60

Ser Phe Leu Glu Ile Ser Phe Thr Ser Ile Phe Ile Pro Arg Phe Leu
      65             70             75             80

Thr Ser Met Thr Thr Gly Asn Lys Val Ile Ser Phe Ala Gly Cys Leu
      85             90             95

Thr Gln Tyr Phe Phe Ala Ile Phe Leu Gly Ala Thr Glu Phe Tyr Leu
      100            105            110

Leu Ala Ser Met Ser Tyr Asp Arg Tyr Val Ala Ile Cys Lys Pro Leu
      115            120            125

His Tyr Leu Thr Ile Met Ser Ser Arg Val Cys Ile Gln Leu Val Phe
      130            135            140

Cys Ser Trp Leu Gly Gly Phe Leu Ala Ile Leu Pro Pro Ile Ile Leu
      145            150            155            160

Met Thr Gln Val Asp Phe Cys Val Ser Asn Ile Leu Asn His Tyr Tyr
      165            170            175

Cys Asp Tyr Gly Pro Leu Val Glu Leu Ala Cys Ser Asp Thr Ser Leu
      180            185            190

Leu Glu Leu Met Val Ile Leu Leu Ala Val Val Thr Leu Met Val Thr
      195            200            205

Leu Val Leu Val Thr Leu Ser Tyr Thr Tyr Ile Ile Arg Thr Ile Leu
      210            215            220

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Arg Ile Pro Ser Ala Gln Gln Arg Thr Lys Ala Phe Ser Thr Cys Ser  
 225 230 235 240  
 Ser His Met Ile Val Ile Ser Leu Ser Tyr Gly Ser Cys Met Phe Met  
 245 250 255  
 Tyr Ile Asn Pro Ser Ala Lys Glu Gly Gly Ala Phe Asn Lys Gly Ile  
 260 265 270  
 Ala Val Leu Ile Thr Ser Val Thr Pro Leu Leu Asn Pro Phe Ile Tyr  
 275 280 285  
 Thr Leu Arg Asn Gln Gln Val Lys Gln Ala Phe Lys Asp Ser Val Lys  
 290 295 300  
 Lys Ile Val Lys Leu  
 305

<210> 185  
 <211> 1601  
 <212> DNA  
 <213> Homo sapiens

<400> 185  
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 ggcaaatatc taaacattag ccggaattt tatgctccgt atactgggta ctaatttaca 120  
 taaacatata agtaaagtct acacatatga gactgttttc ttgatagatc atggaaggaa 180  
 aaatccattc agggaaaaaa aagggaata ctatataaat gtcaaaaatc cagtcttttt 240  
 aagagacatt ctctggaaat atctctatct tgagggtgtag tagattatct tacatatata 300  
 tccactcaca cataccttcc agttagaaca ctgaagcctc atcattgtaa ttaaagcaat 360  
 aaattttgta aaaatgaaaa ggataattgt gggaggagat tctaaacact ctttttctaa 420  
 tgagctgctc tgtgtcgcca ggggaaacat ggttgagtaa ggcatcacat ttttgacatg 480  
 gagcttctga caaataatct caaatttatc attgaccctt ttgtttacag gttctgacac 540  
 cttagtccaa taccttcaga agaacacatg gaaaatagga aaaattgact taattcatcc 600  
 tcttggggct cacacagaac cctgagggcc aaaaagtttt atttgtcaca ttcttactca 660  
 tctacattgt gacgataatg ggcaacctcc ttatcatggt gaccatcatg gccagccagt 720  
 ccttgggttc ccccatgtac ttttttctgg cttctttatc atttatacat accgtctatt 780  
 atactgccat tgctcccaaa atgattgttg acctgctctc tgagaaaaag accatttctt 840  
 ttcagggttg tatggctcaa ctttttatgg atcatttatt tgctgggtgct gaggtcattc 900  
 ttctgggttg aatggcctat gatcaatatg tggccatctg taagcctctt cattatttga 960  
 tcatcatgaa tcgtcgagtc tgtgttctca tgctgttggt ggccctggatt ggaggctttc 1020  
 ttcactcatt ggttcaattt ctctttatct atcagctccc tttctgtgga cccaatgtca 1080  
 ttgacaactt cctgtgtgat ttgtatccct tattgaaact tgcttgacc aatacctatg 1140  
 tcaactgggt ttctatgata gctaattggt gagcgatttg tactgtcacc ttcttccctc 1200  
 tcctgctttc ctatggggtc atattaccct ctcttaagac tcagagtttg gaagggaat 1260  
 gcaaagcttt ctacacctgt gcatcccaca tcaactgtgat cactttattc tttgtcccct 1320  
 gcatcttcct gtttgaagg cccaactcca cctttcccat tgataaatcc atgactgtgg 1380  
 ttttaacttg tataactccc atgctgaaac cactaatcta tgccctgagg aatgcagaaa 1440  
 tgaaggtgc catgaggaaa ctttggagtg aaaaagtaag cttagctgga aaagggtgt 1500  
 atccctcatg agaatatgac tttcattctt tcacagaagc aaggaataat ttcactatcc 1560  
 tatcagatta ctttctgtt atcattcgcc tttagttatt t 1601

<210> 186  
 <211> 277

<212> PRT

<213> Homo sapiens

<400> 186

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Met | Gly | Asn | Leu | Leu | Ile | Met | Val | Thr | Ile | Met | Ala | Ser | Gln | Ser | Leu |  |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |  |
| Gly | Ser | Pro | Met | Tyr | Phe | Phe | Leu | Ala | Ser | Leu | Ser | Phe | Ile | His | Thr |  |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |  |
| Val | Tyr | Tyr | Thr | Ala | Ile | Ala | Pro | Lys | Met | Ile | Val | Asp | Leu | Leu | Ser |  |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |  |
| Glu | Lys | Lys | Thr | Ile | Ser | Phe | Gln | Gly | Cys | Met | Ala | Gln | Leu | Phe | Met |  |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |  |
| Asp | His | Leu | Phe | Ala | Gly | Ala | Glu | Val | Ile | Leu | Leu | Val | Val | Met | Ala |  |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |  |
| Tyr | Asp | Gln | Tyr | Val | Ala | Ile | Cys | Lys | Pro | Leu | His | Tyr | Leu | Ile | Ile |  |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |  |
| Met | Asn | Arg | Arg | Val | Cys | Val | Leu | Met | Leu | Leu | Val | Ala | Trp | Ile | Gly |  |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |  |
| Gly | Phe | Leu | His | Ser | Leu | Val | Gln | Phe | Leu | Phe | Ile | Tyr | Gln | Leu | Pro |  |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |  |
| Phe | Cys | Gly | Pro | Asn | Val | Ile | Asp | Asn | Phe | Leu | Cys | Asp | Leu | Tyr | Pro |  |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |  |
| Leu | Leu | Lys | Leu | Ala | Cys | Thr | Asn | Thr | Tyr | Val | Thr | Gly | Leu | Ser | Met |  |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |  |
| Ile | Ala | Asn | Gly | Gly | Ala | Ile | Cys | Thr | Val | Thr | Phe | Phe | Pro | Leu | Leu |  |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |  |
| Leu | Ser | Tyr | Gly | Val | Ile | Leu | Pro | Ser | Leu | Lys | Thr | Gln | Ser | Leu | Glu |  |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |  |
| Gly | Lys | Cys | Lys | Ala | Phe | Tyr | Thr | Cys | Ala | Ser | His | Ile | Thr | Val | Ile |  |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |  |
| Thr | Leu | Phe | Phe | Val | Pro | Cys | Ile | Phe | Leu | Phe | Val | Arg | Pro | Asn | Ser |  |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |  |
| Thr | Phe | Pro | Ile | Asp | Lys | Ser | Met | Thr | Val | Val | Leu | Thr | Cys | Ile | Thr |  |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     | 240 |     |  |
| Pro | Met | Leu | Lys | Pro | Leu | Ile | Tyr | Ala | Leu | Arg | Asn | Ala | Glu | Met | Lys |  |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |  |
| Ser | Ala | Met | Arg | Lys | Leu | Trp | Ser | Glu | Lys | Val | Ser | Leu | Ala | Gly | Lys |  |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     |     | 270 |     |  |
| Gly | Leu | Tyr | Pro | Ser |     |     |     |     |     |     |     |     |     |     |     |  |
|     |     | 275 |     |     |     |     |     |     |     |     |     |     |     |     |     |  |



<210> 187  
 <211> 1006  
 <212> DNA  
 <213> Homo sapiens

<400> 187  
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 gtggggagaa tgtaccaag gtcagcacct tcctcctggt gggcctcccc acggccccag 120  
 ggctgcagta cctgctcttc ctctctcttc tgctcaccta cctctttgtc ctggtggaga 180  
 acctggccat catcctcatc gtctggagca gcacctccct ccacaggccc atgtactact 240  
 ttctgagctc catgtctttc ctggagatct ggtacgtgtc tgacatcacc cccaagatgc 300  
 tggagggcct cctcctccag cagaaacgca tctctttcgt cgggtgcatg acgcagctct 360  
 acttcttcag ctccctggtg tgcaccgagt gtgtgcttct ggcctccatg gcctacgacc 420  
 gctacgtggc catctgccac ccgctgcgct accacgtcct tgtgaccccg gggctgtgcc 480  
 tccagctggt gggcttctcc tttgtgagt gcttcacat ctccatgatc aaggtctgtt 540  
 ttatctccag cgtcacgttc tgtggctcca acgtcttgaa ccacttcttc tgtgacattt 600  
 ccccatcct caagctggcc tgcacggact tctccactgc agagctggtg gatttcatcc 660  
 tggccttcat catcctggtg tttccgctcc tggccacat actgtcatat tggcacatca 720  
 ccttggtgt cctgcgcac cctcggcca ccggtgctg gagagccttc tctacctgcg 780  
 cctctcacct caccgtggtc accgtcttct atacagcctt gcttttcatg tatgtccggc 840  
 cccaagccat tgattcccag agctccaaca agctcatctc tgccgtgtac actgttgtca 900  
 cgccaataat taaccctttg atttactgcc tgaggaacaa ggaatttaag gacgccttga 960  
 aaaaggcctt gggcttgggt caaacttcac actaagacaa ctaaat 1006

<210> 188  
 <211> 324  
 <212> PRT  
 <213> Homo sapiens

<400> 188  
 Met Phe Cys Arg Pro Ala Ala Pro Lys His Arg Gly Met Ser Gly Glu  
 1 5 10 15  
 Asn Val Thr Lys Val Ser Thr Phe Ile Leu Val Gly Leu Pro Thr Ala  
 20 25 30  
 Pro Gly Leu Gln Tyr Leu Leu Phe Leu Leu Phe Leu Leu Thr Tyr Leu  
 35 40 45  
 Phe Val Leu Val Glu Asn Leu Ala Ile Ile Leu Ile Val Trp Ser Ser  
 50 55 60  
 Thr Ser Leu His Arg Pro Met Tyr Tyr Phe Leu Ser Ser Met Ser Phe  
 65 70 75 80  
 Leu Glu Ile Trp Tyr Val Ser Asp Ile Thr Pro Lys Met Leu Glu Gly  
 85 90 95  
 Phe Leu Leu Gln Gln Lys Arg Ile Ser Phe Val Gly Cys Met Thr Gln  
 100 105 110  
 Leu Tyr Phe Phe Ser Ser Leu Val Cys Thr Glu Cys Val Leu Leu Ala  
 115 120 125

Ser Met Ala Tyr Asp Arg Tyr Val Ala Ile Cys His Pro Leu Arg Tyr  
 130 135 140  
 His Val Leu Val Thr Pro Gly Leu Cys Leu Gln Leu Val Gly Phe Ser  
 145 150 155 160  
 Phe Val Ser Gly Phe Thr Ile Ser Met Ile Lys Val Cys Phe Ile Ser  
 165 170 175  
 Ser Val Thr Phe Cys Gly Ser Asn Val Leu Asn His Phe Phe Cys Asp  
 180 185 190  
 Ile Ser Pro Ile Leu Lys Leu Ala Cys Thr Asp Phe Ser Thr Ala Glu  
 195 200 205  
 Leu Val Asp Phe Ile Leu Ala Phe Ile Ile Leu Val Phe Pro Leu Leu  
 210 215 220  
 Ala Thr Ile Leu Ser Tyr Trp His Ile Thr Leu Ala Val Leu Arg Ile  
 225 230 235 240  
 Pro Ser Ala Thr Gly Cys Trp Arg Ala Phe Ser Thr Cys Ala Ser His  
 245 250 255  
 Leu Thr Val Val Thr Val Phe Tyr Thr Ala Leu Leu Phe Met Tyr Val  
 260 265 270  
 Arg Pro Gln Ala Ile Asp Ser Gln Ser Ser Asn Lys Leu Ile Ser Ala  
 275 280 285  
 Val Tyr Thr Val Val Thr Pro Ile Ile Asn Pro Leu Ile Tyr Cys Leu  
 290 295 300  
 Arg Asn Lys Glu Phe Lys Asp Ala Leu Lys Lys Ala Leu Gly Leu Gly  
 305 310 315 320  
 Gln Thr Ser His

<210> 189  
 <211> 1039  
 <212> DNA  
 <213> Homo sapiens

<400> 189  
 gaatgatgcc cttttgccac aatataatta atatttcctg tgtgaaaaac aactgggtcaa 60  
 atgatgtccg tgcttccctg tacagtttaa tgggtgctcat aattctgacc acactcgttg 120  
 gcaatctgat agttattggt tctatatcac acttcaaaca acttcatacc ccaacaaatt 180  
 ggctcattca ttccatggcc actgtggact ttcttctggg gtgtctggtc atgccttaca 240  
 gtatggtgag atctgctgag cactgttggg attttggaga agtcttctgt aaaattcaca 300  
 caagcaccga cattatgctg agctcagcct ccattttcca tttgtctttc atctccattg 360  
 accgctacta tgctgtgtgt gatccactga gatataaagc caagatgaat atcttggtta 420  
 tttgtgtgat gatcttcatt agttggagtg tccctgctgt ttttgcatth ggaatgatct 480  
 ttctggagct aaacttcaaa ggcgctgaag agatatatta caaacatggt cactgcagag 540  
 gaggttgctc tgtcttcttt agcaaaatat ctgggggtact gacctttatg acttcttttt 600  
 atatacctgg atctattatg ttatgtgtct attacagaat atatcttatc gctaaagaac 660

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aggcaagatt aattagtgat gccaatcaga agctccaaat tggattggaa atgaaaaatg 720
gaatttcaca aagcaaagaa aggaaagctg tgaagacatt ggggattgtg atgggagttt 780
tcctaatatg ctggtgccct ttctttatct gtacagtcac ggaccctttt cttcactaca 840
ttattccacc tactttgaat gatgtattga tttggtttgg ctacttgaac tctacattta 900
atccaatggg ttatgcattt ttctatcctt ggttttagaaa agcactgaag atgatgctgt 960
ttggtaaaat tttccaaaaa gattcatcca ggtgtaaatt atttttggaa ttgagttcat 1020
agaattatta tattttact 1039

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<210> 190
<211> 339
<212> PRT
<213> Homo sapiens

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<400> 190
Met Met Pro Phe Cys His Asn Ile Ile Asn Ile Ser Cys Val Lys Asn
  1             5             10             15

Asn Trp Ser Asn Asp Val Arg Ala Ser Leu Tyr Ser Leu Met Val Leu
      20             25             30

Ile Ile Leu Thr Thr Leu Val Gly Asn Leu Ile Val Ile Val Ser Ile
      35             40             45

Ser His Phe Lys Gln Leu His Thr Pro Thr Asn Trp Leu Ile His Ser
      50             55             60

Met Ala Thr Val Asp Phe Leu Leu Gly Cys Leu Val Met Pro Tyr Ser
      65             70             75             80

Met Val Arg Ser Ala Glu His Cys Trp Tyr Phe Gly Glu Val Phe Cys
      85             90             95

Lys Ile His Thr Ser Thr Asp Ile Met Leu Ser Ser Ala Ser Ile Phe
      100            105            110

His Leu Ser Phe Ile Ser Ile Asp Arg Tyr Tyr Ala Val Cys Asp Pro
      115            120            125

Leu Arg Tyr Lys Ala Lys Met Asn Ile Leu Val Ile Cys Val Met Ile
      130            135            140

Phe Ile Ser Trp Ser Val Pro Ala Val Phe Ala Phe Gly Met Ile Phe
      145            150            155            160

Leu Glu Leu Asn Phe Lys Gly Ala Glu Glu Ile Tyr Tyr Lys His Val
      165            170            175

His Cys Arg Gly Gly Cys Ser Val Phe Phe Ser Lys Ile Ser Gly Val
      180            185            190

Leu Thr Phe Met Thr Ser Phe Tyr Ile Pro Gly Ser Ile Met Leu Cys
      195            200            205

Val Tyr Tyr Arg Ile Tyr Leu Ile Ala Lys Glu Gln Ala Arg Leu Ile
      210            215            220

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Ser Asp Ala Asn Gln Lys Leu Gln Ile Gly Leu Glu Met Lys Asn Gly  
 225 230 235 240  
 Ile Ser Gln Ser Lys Glu Arg Lys Ala Val Lys Thr Leu Gly Ile Val  
 245 250 255  
 Met Gly Val Phe Leu Ile Cys Trp Cys Pro Phe Phe Ile Cys Thr Val  
 260 265 270  
 Met Asp Pro Phe Leu His Tyr Ile Ile Pro Pro Thr Leu Asn Asp Val  
 275 280 285  
 Leu Ile Trp Phe Gly Tyr Leu Asn Ser Thr Phe Asn Pro Met Val Tyr  
 290 295 300  
 Ala Phe Phe Tyr Pro Trp Phe Arg Lys Ala Leu Lys Met Met Leu Phe  
 305 310 315 320  
 Gly Lys Ile Phe Gln Lys Asp Ser Ser Arg Cys Lys Leu Phe Leu Glu  
 325 330 335

Leu Ser Ser

<210> 191  
 <211> 1039  
 <212> DNA  
 <213> Homo sapiens

<400> 191  
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 atgatgtccg tgcttccctg tacagtttaa tgggtgctcat aattctgacc aactcgttg 120  
 gcaatctgat agttattgtt tctatatcac acttcaaaca acttcatacc ccaacaaatt 180  
 ggctcattca ttccatggcc actgtggact ttcttctggg gtgtctggtc atgccttaca 240  
 gtatggtgag atctgctgag cactgttggt attttggaga agtcttctgt aaaattcaca 300  
 caagcaccca cattatgctg agctcagcct ccatTTTTCCA tttgtctttc atctccattg 360  
 accgctacta tgctgtgtgt gatccactga gatataaagc caagatgaat atcttgggta 420  
 tttgtgtgat gatcttcatt agttggagtg tccctgctgt ttttgcattt ggaatgatct 480  
 ttctggagct aaacttcaaa ggcgctgaag agatatatta caaacatgtt cactgcagag 540  
 gaggttgctc tgtcttcttt agcaaaatat ctgggggtact gacctttatg acttcttttt 600  
 atatacctgg atctattatg ttatgtgtct attacagaat atatcttatc gctaaagaac 660  
 aggcaagatt aattagtgat gccaatcaga agctccaaat tggattggaa atgaaaaatg 720  
 gaatttcaca aagcaaagaa aggaaagctg tgaagacatt ggggattgtg atgggagttt 780  
 tctaataatg ctggtgccct ttctttatct gtacagtcac ggaccctttt cttcactaca 840  
 ttattccacc tactttgaat gatgtattga tttgggtttg ctacttgaac tctacattta 900  
 atccaatggg ttatgcattt ttctatcctt ggttttagaaa agcactgaag atgatgctgt 960  
 ttggtaaaat tttccaaaaa gattcatcca ggtgtaaatt attttttgaa ttgagttcat 1020  
 agaattatta tatttttact 1039

<210> 192  
 <211> 339  
 <212> PRT  
 <213> Homo sapiens

<400> 192

Met Met Pro Phe Cys His Asn Ile Ile Asn Ile Ser Cys Val Lys Asn  
 1 5 10 15  
 Asn Trp Ser Asn Asp Val Arg Ala Ser Leu Tyr Ser Leu Met Val Leu  
 20 25 30  
 Ile Ile Leu Thr Thr Leu Val Gly Asn Leu Ile Val Ile Val Ser Ile  
 35 40 45  
 Ser His Phe Lys Gln Leu His Thr Pro Thr Asn Trp Leu Ile His Ser  
 50 55 60  
 Met Ala Thr Val Asp Phe Leu Leu Gly Cys Leu Val Met Pro Tyr Ser  
 65 70 75 80  
 Met Val Arg Ser Ala Glu His Cys Trp Tyr Phe Gly Glu Val Phe Cys  
 85 90 95  
 Lys Ile His Thr Ser Thr Asp Ile Met Leu Ser Ser Ala Ser Ile Phe  
 100 105 110  
 His Leu Ser Phe Ile Ser Ile Asp Arg Tyr Tyr Ala Val Cys Asp Pro  
 115 120 125  
 Leu Arg Tyr Lys Ala Lys Met Asn Ile Leu Val Ile Cys Val Met Ile  
 130 135 140  
 Phe Ile Ser Trp Ser Val Pro Ala Val Phe Ala Phe Gly Met Ile Phe  
 145 150 155 160  
 Leu Glu Leu Asn Phe Lys Gly Ala Glu Glu Ile Tyr Tyr Lys His Val  
 165 170 175  
 His Cys Arg Gly Gly Cys Ser Val Phe Phe Ser Lys Ile Ser Gly Val  
 180 185 190  
 Leu Thr Phe Met Thr Ser Phe Tyr Ile Pro Gly Ser Ile Met Leu Cys  
 195 200 205  
 Val Tyr Tyr Arg Ile Tyr Leu Ile Ala Lys Glu Gln Ala Arg Leu Ile  
 210 215 220  
 Ser Asp Ala Asn Gln Lys Leu Gln Ile Gly Leu Glu Met Lys Asn Gly  
 225 230 235 240  
 Ile Ser Gln Ser Lys Glu Arg Lys Ala Val Lys Thr Leu Gly Ile Val  
 245 250 255  
 Met Gly Val Phe Leu Ile Cys Trp Cys Pro Phe Phe Ile Cys Thr Val  
 260 265 270  
 Met Asp Pro Phe Leu His Tyr Ile Ile Pro Pro Thr Leu Asn Asp Val  
 275 280 285  
 Leu Ile Trp Phe Gly Tyr Leu Asn Ser Thr Phe Asn Pro Met Val Tyr  
 290 295 300

Ala Phe Phe Tyr Pro Trp Phe Arg Lys Ala Leu Lys Met Met Leu Phe  
 305 310 315 320

Gly Lys Ile Phe Gln Lys Asp Ser Ser Arg Cys Lys Leu Phe Leu Glu  
 325 330 335

Leu Ser Ser

<210> 193  
 <211> 1033  
 <212> DNA  
 <213> Homo sapiens

<400> 193  
 aaccatgacc agcaattttt cccaacctgt tgtgcagctt tgctatgagg atgtgaatgg 60  
 atcttgtatt gaaactccct attctcctgg gtcccgggta attctgtaca cggcggttag 120  
 ctttgggtct ttgctggctg tatttggaat tctcttagta atgacttctg ttcttcattt 180  
 taagcagctg cactctccaa ccaattttct cattgcctct ctggcctgtg ctgacttctt 240  
 ggtaggtgtg actgtgatgc ttttcagcat ggtcaggacg gtggagagct gctgggtattt 300  
 tggagccaaa ttttgtactc ttcacagttg ctgtgatgtg gcattttgtt actcttctgt 360  
 cctccacttg tgcttcatct gcatcgacag gtacattgtg gttactgatc ccctgggtcta 420  
 tgctaccaag ttcaccgtgt ctgtgtcggg aatttgcac agcgtgtcct ggattctgcc 480  
 tctcacgtac agcgggtgtg tgttctacac aggtgtcaat gatgatgggc tggaggaatt 540  
 agtaagtgtc ctcaactgct taggtggctg tcaaattatt gtaagtcaag gctgggtgtt 600  
 gatagatttt ctgttattct tcatacctac ccttgttatg ataattcttt acagtaagat 660  
 ttttcttata gctaaacaac aagctataaa aattgaaact actagtagca aagtagaatc 720  
 atcctcagag agttataaaa tcagagtggc caagagagag aggaaagcag ctaaaaccct 780  
 ggggggtcacg gtactagcat ttgttatttc atggttaccg tatacagttg atatattaat 840  
 tgatgccttt atgggcttcc tgaccctgc ctatatctat gaaatttgct gttggagtgc 900  
 ttattataac tcagccatga atcctttgat ttatgctcta ttttatcctt gggttaggaa 960  
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 atttttagaa taa 1033

<210> 194  
 <211> 342  
 <212> PRT  
 <213> Homo sapiens

<400> 194  
 Met Thr Ser Asn Phe Ser Gln Pro Val Val Gln Leu Cys Tyr Glu Asp  
 1 5 10 15  
 Val Asn Gly Ser Cys Ile Glu Thr Pro Tyr Ser Pro Gly Ser Arg Val  
 20 25 30  
 Ile Leu Tyr Thr Ala Phe Ser Phe Gly Ser Leu Leu Ala Val Phe Gly  
 35 40 45  
 Asn Leu Leu Val Met Thr Ser Val Leu His Phe Lys Gln Leu His Ser  
 50 55 60  
 Pro Thr Asn Phe Leu Ile Ala Ser Leu Ala Cys Ala Asp Phe Leu Val  
 65 70 75 80

Gly Val Thr Val Met Leu Phe Ser Met Val Arg Thr Val Glu Ser Cys  
                                     85                                    90                                    95  
 Trp Tyr Phe Gly Ala Lys Phe Cys Thr Leu His Ser Cys Cys Asp Val  
                                     100                                    105                                    110  
 Ala Phe Cys Tyr Ser Ser Val Leu His Leu Cys Phe Ile Cys Ile Asp  
                                     115                                    120                                    125  
 Arg Tyr Ile Val Val Thr Asp Pro Leu Val Tyr Ala Thr Lys Phe Thr  
                                     130                                    135                                    140  
 Val Ser Val Ser Gly Ile Cys Ile Ser Val Ser Trp Ile Leu Pro Leu  
                                     145                                    150                                    155                                    160  
 Thr Tyr Ser Gly Ala Val Phe Tyr Thr Gly Val Asn Asp Asp Gly Leu  
                                     165                                    170                                    175  
 Glu Glu Leu Val Ser Ala Leu Asn Cys Val Gly Gly Cys Gln Ile Ile  
                                     180                                    185                                    190  
 Val Ser Gln Gly Trp Val Leu Ile Asp Phe Leu Leu Phe Phe Ile Pro  
                                     195                                    200                                    205  
 Thr Leu Val Met Ile Ile Leu Tyr Ser Lys Ile Phe Leu Ile Ala Lys  
                                     210                                    215                                    220  
 Gln Gln Ala Ile Lys Ile Glu Thr Thr Ser Ser Lys Val Glu Ser Ser  
                                     225                                    230                                    235                                    240  
 Ser Glu Ser Tyr Lys Ile Arg Val Ala Lys Arg Glu Arg Lys Ala Ala  
                                     245                                    250                                    255  
 Lys Thr Leu Gly Val Thr Val Leu Ala Phe Val Ile Ser Trp Leu Pro  
                                     260                                    265                                    270  
 Tyr Thr Val Asp Ile Leu Ile Asp Ala Phe Met Gly Phe Leu Thr Pro  
                                     275                                    280                                    285  
 Ala Tyr Ile Tyr Glu Ile Cys Cys Trp Ser Ala Tyr Tyr Asn Ser Ala  
                                     290                                    295                                    300  
 Met Asn Pro Leu Ile Tyr Ala Leu Phe Tyr Pro Trp Phe Arg Lys Ala  
                                     305                                    310                                    315                                    320  
 Ile Lys Leu Ile Leu Ser Gly Asp Val Leu Lys Ala Ser Ser Ser Thr  
                                     325                                    330                                    335  
 Ile Ser Leu Phe Leu Glu  
                                     340

<210> 195  
 <211> 1045  
 <212> DNA  
 <213> Homo sapiens

<400> 195

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tggctttggg gctgtgctgg ctgtgtttgg aaacctcctg gtgatgattt caatcctcca 180
tttcaagcag ctgcactctc cgaccaatth tctcgttgcc tctctggcct gcgctgattt 240
cttgggtggg gtgactgtga tgcccttcag catggtcagg acgggtggaga gctgctggta 300
ttttgggagg agtttttgta ctttccacac ctgctgtgat gtggcatttt gttactcttc 360
tctctttcac ttgtgcttca tctccatcga caggtagatt gcggttactg acccctgggt 420
ctatcctacc aagttcaccg tatctgtgtc aggaatttgc atcagcgtgt cctggatcct 480
gccccctcatg tacagcgggt ctgtgtttcta cacagggtgc tatgacgatg ggctggagga 540
attatctgat gccctaaact gtataggagg ttgtcagacc gttgtaaatc aaaactgggt 600
gttgacagat tttctatcct tctttatacc tacctttatt atgataattc tgtatggtaa 660
catatttctt gtggctagac gacaggcgaa aaagatagaa aatactggta gcaagacaga 720
atcatcctca gagagttaca aagccagagt ggccaggaga gagagaaaag cagctaaaac 780
cctggggggtc acagtggtag catttatgat ttcattggtta ccatatagca ttgattcatt 840
aattgatgcc tttatgggct ttataacccc tgctgtattt tatgagattt gctgttggtg 900
tgcttattat aactcagcca tgaatccttt gatttatgct ttattttacc catgggttag 960
gaaagcaata aaagttattg taactgggtc ggttttaaag aacagttcag caaccatgaa 1020
tttgttttct gaacatatat aagca 1045
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<210> 196

<211> 345

<212> PRT

<213> Homo sapiens

<400> 196

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Met Ser Ser Asn Ser Ser Leu Leu Val Ala Val Gln Leu Cys Tyr Ala
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Asn Val Asn Gly Ser Cys Val Lys Ile Pro Phe Ser Pro Gly Ser Arg
      20              25              30

Val Ile Leu Tyr Ile Val Phe Gly Phe Gly Ala Val Leu Ala Val Phe
      35              40              45

Gly Asn Leu Leu Val Met Ile Ser Ile Leu His Phe Lys Gln Leu His
      50              55              60

Ser Pro Thr Asn Phe Leu Val Ala Ser Leu Ala Cys Ala Asp Phe Leu
      65              70              75              80

Val Gly Val Thr Val Met Pro Phe Ser Met Val Arg Thr Val Glu Ser
      85              90              95

Cys Trp Tyr Phe Gly Arg Ser Phe Cys Thr Phe His Thr Cys Cys Asp
      100              105              110

Val Ala Phe Cys Tyr Ser Ser Leu Phe His Leu Cys Phe Ile Ser Ile
      115              120              125

Asp Arg Tyr Ile Ala Val Thr Asp Pro Leu Val Tyr Pro Thr Lys Phe
      130              135              140

Thr Val Ser Val Ser Gly Ile Cys Ile Ser Val Ser Trp Ile Leu Pro
      145              150              155              160
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Leu Met Tyr Ser Gly Ala Val Phe Tyr Thr Gly Val Tyr Asp Asp Gly  
 165 170 175  
 Leu Glu Glu Leu Ser Asp Ala Leu Asn Cys Ile Gly Gly Cys Gln Thr  
 180 185 190  
 Val Val Asn Gln Asn Trp Val Leu Thr Asp Phe Leu Ser Phe Phe Ile  
 195 200 205  
 Pro Thr Phe Ile Met Ile Ile Leu Tyr Gly Asn Ile Phe Leu Val Ala  
 210 215 220  
 Arg Arg Gln Ala Lys Lys Ile Glu Asn Thr Gly Ser Lys Thr Glu Ser  
 225 230 235 240  
 Ser Ser Glu Ser Tyr Lys Ala Arg Val Ala Arg Arg Glu Arg Lys Ala  
 245 250 255  
 Ala Lys Thr Leu Gly Val Thr Val Val Ala Phe Met Ile Ser Trp Leu  
 260 265 270  
 Pro Tyr Ser Ile Asp Ser Leu Ile Asp Ala Phe Met Gly Phe Ile Thr  
 275 280 285  
 Pro Ala Cys Ile Tyr Glu Ile Cys Cys Trp Cys Ala Tyr Tyr Asn Ser  
 290 295 300  
 Ala Met Asn Pro Leu Ile Tyr Ala Leu Phe Tyr Pro Trp Phe Arg Lys  
 305 310 315 320  
 Ala Ile Lys Val Ile Val Thr Gly Gln Val Leu Lys Asn Ser Ser Ala  
 325 330 335  
 Thr Met Asn Leu Phe Ser Glu His Ile  
 340 345

<210> 197

<211> 948

<212> DNA

<213> Homo sapiens

<400> 197

cctttgtaaa tggccttggg gaatcacagc accatcaccc agttcctcct ccttgggctg 60  
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 accataatgg aaaacctgat gctgctgctc atgatcaggg ctgattcttg tctccataag 180  
 cccatgtatt tcttcctgag tcacctctct tttgttgatc tctgcttctc ttcagtcatt 240  
 gtgcccaaga tgctggagaa cctcctgtca cagaggaaaa ccatttcagt agagggctgc 300  
 ctggctcagg tcttctttgt gttgtcact gcagggactg aagcctgcct tctctcaggg 360  
 atggcctatg accgccatgc tgccatctgc cgcccactac tttatggaca gatcatgggt 420  
 aaacagctgt atatgcacct tgtgtggggc tcatggggac tgggctttct ggacgcactc 480  
 atcaatgtcc tcctagctgt aaacatggtc ttttgtgaag ccaaaatcat tcaccactac 540  
 agctatgaga tgccatccct cctccctctg tcctgctctg atatctccag aagcctcatc 600  
 gccttgctct gctccactct cctacatggg ctgggaaact tccttttggt cttcttatcc 660  
 tacacccgta taatctctac catcctaagc atcagctcta cctcgggcag aagcaaggcc 720  
 ttctccacct gctctgcca cctcactgca gtgacacttt actatggctc aggtttgctc 780  
 cgccatctca tgccaaactc aggttcccc atagagttga tcttctctgt gcagtatact 840

gtagtcactc ccatgctgaa ttccctcatc tatagcctga aaaataagga agtgaaggta 900  
gctctgaaaa gaactttgga aaaatatttg caatatacca gacgttga 948

<210> 198  
<211> 312  
<212> PRT  
<213> Homo sapiens

<400> 198  
Met Ala Leu Gly Asn His Ser Thr Ile Thr Glu Phe Leu Leu Leu Gly  
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20 25 30  
Gly Ile Tyr Leu Leu Thr Ile Met Glu Asn Leu Met Leu Leu Leu Met  
35 40 45  
Ile Arg Ala Asp Ser Cys Leu His Lys Pro Met Tyr Phe Phe Leu Ser  
50 55 60  
His Leu Ser Phe Val Asp Leu Cys Phe Ser Ser Val Ile Val Pro Lys  
65 70 75 80  
Met Leu Glu Asn Leu Leu Ser Gln Arg Lys Thr Ile Ser Val Glu Gly  
85 90 95  
Cys Leu Ala Gln Val Phe Phe Val Phe Val Thr Ala Gly Thr Glu Ala  
100 105 110  
Cys Leu Leu Ser Gly Met Ala Tyr Asp Arg His Ala Ala Ile Cys Arg  
115 120 125  
Pro Leu Leu Tyr Gly Gln Ile Met Gly Lys Gln Leu Tyr Met His Leu  
130 135 140  
Val Trp Gly Ser Trp Gly Leu Gly Phe Leu Asp Ala Leu Ile Asn Val  
145 150 155 160  
Leu Leu Ala Val Asn Met Val Phe Cys Glu Ala Lys Ile Ile His His  
165 170 175  
Tyr Ser Tyr Glu Met Pro Ser Leu Leu Pro Leu Ser Cys Ser Asp Ile  
180 185 190  
Ser Arg Ser Leu Ile Ala Leu Leu Cys Ser Thr Leu Leu His Gly Leu  
195 200 205  
Gly Asn Phe Leu Leu Val Phe Leu Ser Tyr Thr Arg Ile Ile Ser Thr  
210 215 220  
Ile Leu Ser Ile Ser Ser Thr Ser Gly Arg Ser Lys Ala Phe Ser Thr  
225 230 235 240  
Cys Ser Ala His Leu Thr Ala Val Thr Leu Tyr Tyr Gly Ser Gly Leu  
245 250 255

Leu Arg His Leu Met Pro Asn Ser Gly Ser Pro Ile Glu Leu Ile Phe  
 260 265 270

Ser Val Gln Tyr Thr Val Val Thr Pro Met Leu Asn Ser Leu Ile Tyr  
 275 280 285

Ser Leu Lys Asn Lys Glu Val Lys Val Ala Leu Lys Arg Thr Leu Glu  
 290 295 300

Lys Tyr Leu Gln Tyr Thr Arg Arg  
 305 310

<210> 199

<211> 1039

<212> DNA

<213> Homo sapiens

<400> 199

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gaatgatgcc cttttgccac aatataatta atatttcctg tgtgaaaaac aactgggtcaa 60
atgatgtccg tgcttccctg tacagtttaa tgggtgctcat aattctgacc acactcgttg 120
gcaatctgat agttattgtt tctatatcac acttcaaaca acttcatacc ccaacaaatt 180
ggctcattca ttccatggcc actgtggact ttcttctggg gtgtctgggc atgccttaca 240
gtatgggtgag atctgctgag cactgttggg attttggaga agtcttctgt aaaattcaca 300
caagcaccga cattatgctg agctcagcct ccattttcca tttgtctttc atctccattg 360
accgctacta tgctgtgtgt gatccactga gatataaagc caagatgaat atcttggtta 420
tttgtgtgat gatcttcatt agttggagtg tccctgctgt ttttgcattt ggaatgatct 480
ttctggagct aaacttcaaa ggcgctgaag agatatatta caaacatgtt cactgcagag 540
gaggttgctc tgtcttcttt agcaaaatat ctgggggtact gacctttatg acttcttttt 600
atatacctgg atctattatg ttatgtgtct attacagaat atatcttatc gctaaagaac 660
aggcaagatt aattagtgat gccaatcaga agctccaaat tggattggaa atgaaaaatg 720
gaatttcaca aagcaaagaa aggaaagctg tgaagacatt ggggattgtg atgggagttt 780
tcctaatatg ctggtgccct ttctttatct gtacagtcac ggaccctttt cttcactaca 840
ttattccacc tactttgaat gatgtattga tttggtttgg ctacttgaac tctacattta 900
atccaatggg ttatgcattt ttctatcctt ggtttagaaa agcactgaag atgatgctgt 960
ttggtaaaat tttccaaaaa gattcatcca ggtgtaaatt atttttggaa ttgagttcat 1020
agaattatta tattttact 1039

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<210> 200

<211> 339

<212> PRT

<213> Homo sapiens

<400> 200

Met Met Pro Phe Cys His Asn Ile Ile Asn Ile Ser Cys Val Lys Asn  
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Asn Trp Ser Asn Asp Val Arg Ala Ser Leu Tyr Ser Leu Met Val Leu  
 20 25 30

Ile Ile Leu Thr Thr Leu Val Gly Asn Leu Ile Val Ile Val Ser Ile  
 35 40 45

Ser His Phe Lys Gln Leu His Thr Pro Thr Asn Trp Leu Ile His Ser  
 50 55 60

Met Ala Thr Val Asp Phe Leu Leu Gly Cys Leu Val Met Pro Tyr Ser  
 65 70 75 80  
 Met Val Arg Ser Ala Glu His Cys Trp Tyr Phe Gly Glu Val Phe Cys  
 85 90 95  
 Lys Ile His Thr Ser Thr Asp Ile Met Leu Ser Ser Ala Ser Ile Phe  
 100 105 110  
 His Leu Ser Phe Ile Ser Ile Asp Arg Tyr Tyr Ala Val Cys Asp Pro  
 115 120 125  
 Leu Arg Tyr Lys Ala Lys Met Asn Ile Leu Val Ile Cys Val Met Ile  
 130 135 140  
 Phe Ile Ser Trp Ser Val Pro Ala Val Phe Ala Phe Gly Met Ile Phe  
 145 150 155 160  
 Leu Glu Leu Asn Phe Lys Gly Ala Glu Glu Ile Tyr Tyr Lys His Val  
 165 170 175  
 His Cys Arg Gly Gly Cys Ser Val Phe Phe Ser Lys Ile Ser Gly Val  
 180 185 190  
 Leu Thr Phe Met Thr Ser Phe Tyr Ile Pro Gly Ser Ile Met Leu Cys  
 195 200 205  
 Val Tyr Tyr Arg Ile Tyr Leu Ile Ala Lys Glu Gln Ala Arg Leu Ile  
 210 215 220  
 Ser Asp Ala Asn Gln Lys Leu Gln Ile Gly Leu Glu Met Lys Asn Gly  
 225 230 235 240  
 Ile Ser Gln Ser Lys Glu Arg Lys Ala Val Lys Thr Leu Gly Ile Val  
 245 250 255  
 Met Gly Val Phe Leu Ile Cys Trp Cys Pro Phe Phe Ile Cys Thr Val  
 260 265 270  
 Met Asp Pro Phe Leu His Tyr Ile Ile Pro Pro Thr Leu Asn Asp Val  
 275 280 285  
 Leu Ile Trp Phe Gly Tyr Leu Asn Ser Thr Phe Asn Pro Met Val Tyr  
 290 295 300  
 Ala Phe Phe Tyr Pro Trp Phe Arg Lys Ala Leu Lys Met Met Leu Phe  
 305 310 315 320  
 Gly Lys Ile Phe Gln Lys Asp Ser Ser Arg Cys Lys Leu Phe Leu Glu  
 325 330 335  
 Leu Ser Ser

<210> 201

<211> 963  
 <212> DNA  
 <213> Homo sapiens

<400> 201  
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 ccagctctgg agttgttcct ctttgggttt ttcttgctat tctacagctt aaccctgatg 120  
 ggaaatttgg actctagact gcacacaccc atgtatgtct tcctgtcaca tctggccatt 180  
 gtggacatgt cctatgcctc gagtactgtc cctaagatgc tagcaaactc tgtgatgcac 240  
 aaaaaagtca tctcctttgc tccttgcata cttcagactt ttttgtattt ggcgtttgct 300  
 attacagagt gtctgatttt ggtgatgatg tgctatgatc ggtatgtggc aatctgtcac 360  
 cccttgcaat acaccctcat tatgaactgg agagtgtgca ctgtcctggc ctcaacttgc 420  
 tggatattta gctttctctt ggctctgggc catattactc ttattctgag gctgcctttt 480  
 tgtggccaca aaagatcaac cacttttttt ttgtggccac aaaagatcaa ccactttttc 540  
 tgtcaaatca tgtccgtatt caaattggcc tgtgctgaca ctaggctcaa ccagggtggc 600  
 ctatttgagg gttctgcgtt catcttagtg gggccgctct gcctggtgct ggtctcctac 660  
 ttgcacatcc tgggtggccat cttgaggatc cagtctgggg agggccgcag aaaggccttc 720  
 tctacctgct cctcccacct ctgctgggtg gggcttttct ttggcagcgc cattgtcatg 780  
 tacatggccc ccaagtcaag ccattctcaa gaacggagga agatcctttc cctgttttac 840  
 agccttttca acccgatcct gaacccctc atctacagcc ttaatgcaga ggtgaaaggg 900  
 gctctaaaga gagtcctttg gaaacagaga tcaattgaag aatcatttga gatttctga 960  
 gaa 963

<210> 202  
 <211> 318  
 <212> PRT  
 <213> Homo sapiens

<400> 202  
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 1 5 10 15  
 Gln Val Gly Pro Ala Leu Glu Leu Phe Leu Phe Gly Phe Phe Leu Leu  
 20 25 30  
 Phe Tyr Ser Leu Thr Leu Met Gly Asn Leu Asp Ser Arg Leu His Thr  
 35 40 45  
 Pro Met Tyr Val Phe Leu Ser His Leu Ala Ile Val Asp Met Ser Tyr  
 50 55 60  
 Ala Ser Ser Thr Val Pro Lys Met Leu Ala Asn Leu Val Met His Lys  
 65 70 75 80  
 Lys Val Ile Ser Phe Ala Pro Cys Ile Leu Gln Thr Phe Leu Tyr Leu  
 85 90 95  
 Ala Phe Ala Ile Thr Glu Cys Leu Ile Leu Val Met Met Cys Tyr Asp  
 100 105 110  
 Arg Tyr Val Ala Ile Cys His Pro Leu Gln Tyr Thr Leu Ile Met Asn  
 115 120 125  
 Trp Arg Val Cys Thr Val Leu Ala Ser Thr Cys Trp Ile Phe Ser Phe  
 130 135 140

Leu Leu Ala Leu Val His Ile Thr Leu Ile Leu Arg Leu Pro Phe Cys  
 145 150 155 160  
 Gly His Lys Arg Ser Thr Thr Phe Phe Leu Trp Pro Gln Lys Ile Asn  
 165 170 175  
 His Phe Phe Cys Gln Ile Met Ser Val Phe Lys Leu Ala Cys Ala Asp  
 180 185 190  
 Thr Arg Leu Asn Gln Val Val Leu Phe Ala Gly Ser Ala Phe Ile Leu  
 195 200 205  
 Val Gly Pro Leu Cys Leu Val Leu Val Ser Tyr Leu His Ile Leu Val  
 210 215 220  
 Ala Ile Leu Arg Ile Gln Ser Gly Glu Gly Arg Arg Lys Ala Phe Ser  
 225 230 235 240  
 Thr Cys Ser Ser His Leu Cys Val Val Gly Leu Phe Phe Gly Ser Ala  
 245 250 255  
 Ile Val Met Tyr Met Ala Pro Lys Ser Ser His Ser Gln Glu Arg Arg  
 260 265 270  
 Lys Ile Leu Ser Leu Phe Tyr Ser Leu Phe Asn Pro Ile Leu Asn Pro  
 275 280 285  
 Leu Ile Tyr Ser Leu Asn Ala Glu Val Lys Gly Ala Leu Lys Arg Val  
 290 295 300  
 Leu Trp Lys Gln Arg Ser Ile Glu Glu Ser Phe Glu Ile Ser  
 305 310 315

<210> 203  
 <211> 971  
 <212> DNA  
 <213> Homo sapiens

<400> 203  
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 ctttgggctt gttctgcgga cccccaaac aatcccgagg ctttctgccc ttctttgtgc 120  
 tgttcctggg gatttacctc ctgaccataa tggaaaacct gatgctgctg ctcatgatca 180  
 gggctgattc ttgtctccat aagcccatgt atttcttctt ggtcacctc tcttttgttg 240  
 atctctgctt ctcttcagtc attgtgcccc agatgctgga gaacctcctg tcacagagga 300  
 aaaccatttc agtagagggc tgcttggtc aggtcttctt tgtgtttgtc actgcagga 360  
 ctgaagcctg ccttctctca gggatggcct atgaccgcca tgctgccatc tgccgcccac 420  
 tactttatgg acagatcatg ggtaaacagc tgtatatgca ccttggtgtg ggctcatggg 480  
 gactgggctt tctggacgca ctcatcaatg tctcctagc tgtaaacadg gtcttttgtg 540  
 aagccaaaat cattcaccac tacagctatg agatgccatc cctcctccct ctgtcctgct 600  
 ctgatattctc cagaagcctc atcgcttgc tctgctccac tctcctacat gggctgggaa 660  
 acttctcttt ggtcttctta tctacaccc gtataatctc taccatccta agcatcagct 720  
 ctacctcggg cagaagcaag gccttctcca cctgctctgc ccacctcact gcagtgcac 780  
 ttactatagg ctccggtttg ctccgccatc tcatgccaaa ctccaggttcc cccatagagt 840  
 tgatcttctc tgtgcagtat actgtagtca ctcccatgct gaattccctc atctatagcc 900  
 tgaaaaataa ggaagtgaag gtagctctga aaagaacttt ggaaaaatat ttgcaatata 960  
 ccagacgttg a 971

<210> 204  
 <211> 319  
 <212> PRT  
 <213> Homo sapiens

<400> 204  
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 Pro Leu Gly Leu Phe Cys Gly Pro Pro Lys Gln Ser Arg Gly Phe Leu  
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 Pro Phe Phe Val Leu Phe Leu Gly Ile Tyr Leu Leu Thr Ile Met Glu  
 35 40 45  
 Asn Leu Met Leu Leu Leu Met Ile Arg Ala Asp Ser Cys Leu His Lys  
 50 55 60  
 Pro Met Tyr Phe Phe Leu Ser His Leu Ser Phe Val Asp Leu Cys Phe  
 65 70 75 80  
 Ser Ser Val Ile Val Pro Lys Met Leu Glu Asn Leu Leu Ser Gln Arg  
 85 90 95  
 Lys Thr Ile Ser Val Glu Gly Cys Leu Ala Gln Val Phe Phe Val Phe  
 100 105 110  
 Val Thr Ala Gly Thr Glu Ala Cys Leu Leu Ser Gly Met Ala Tyr Asp  
 115 120 125  
 Arg His Ala Ala Ile Cys Arg Pro Leu Leu Tyr Gly Gln Ile Met Gly  
 130 135 140  
 Lys Gln Leu Tyr Met His Leu Val Trp Gly Ser Trp Gly Leu Gly Phe  
 145 150 155 160  
 Leu Asp Ala Leu Ile Asn Val Leu Leu Ala Val Asn Met Val Phe Cys  
 165 170 175  
 Glu Ala Lys Ile Ile His His Tyr Ser Tyr Glu Met Pro Ser Leu Leu  
 180 185 190  
 Pro Leu Ser Cys Ser Asp Ile Ser Arg Ser Leu Ile Ala Leu Leu Cys  
 195 200 205  
 Ser Thr Leu Leu His Gly Leu Gly Asn Phe Leu Leu Val Phe Leu Ser  
 210 215 220  
 Tyr Thr Arg Ile Ile Ser Thr Ile Leu Ser Ile Ser Ser Thr Ser Gly  
 225 230 235 240  
 Arg Ser Lys Ala Phe Ser Thr Cys Ser Ala His Leu Thr Ala Val Thr  
 245 250 255  
 Leu Tyr Tyr Gly Ser Gly Leu Leu Arg His Leu Met Pro Asn Ser Gly

260                                      265                                      270  
 Ser Pro Ile Glu Leu Ile Phe Ser Val Gln Tyr Thr Val Val Thr Pro  
           275                                      280                                      285  
 Met Leu Asn Ser Leu Ile Tyr Ser Leu Lys Asn Lys Glu Val Lys Val  
           290                                      295                                      300  
 Ala Leu Lys Arg Thr Leu Glu Lys Tyr Leu Gln Tyr Thr Arg Arg  
           305                                      310                                      315

<210> 205  
 <211> 1067  
 <212> DNA  
 <213> Homo sapiens

<400> 205  
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 gtggggagaa tgtcaccagg gtcggcacct tcatcctggt gggcttcccc acggccccag 120  
 ggctgcagta cctgctcttc ctccctcttc tgctcaccta cctctttgtc ctgggtggaga 180  
 acctggccat catcctcacc gtctggagca gcacctccct ccacaggccc atgtactact 240  
 ttctgagctc catgtctttc ctagagatct ggtacgtgtc tgacatcacc cccaagatgc 300  
 tggagggctt cctcctccag cagaaacgca tctctttcgt cgggtgcatg acgagctct 360  
 acttcttcag ctccctggtg tgcaccgagt gtgtgcttct ggcctccatg gcctacgacc 420  
 gctacgtggc catctgccac ccgctgcgct accacgtcct tgtgaccccg gggctgtgcc 480  
 tccagctggt gggcttctcc tttgtgagtg gcttcacat ctccatgac aaggtctgtt 540  
 ttatctccag cgtcacgttc tgtggctcca acgtcttgaa ccacttcttc tgtgacattt 600  
 cccccatcct caagtggcc tgcacggact tctccactgc agagctggtg gatttcattc 660  
 tggccttcat catcctggtg tttccactcc tggccacat gctgtcatat gcgcacatca 720  
 ccttggtgt cctgcgcac ccctcggcca ccggtgctg gagagccttc ttcacctgcg 780  
 cctctcacct tgattcccgt accgtcttct atacagcctt gcttttcatg tatgtccggc 840  
 cccaggccat caggctggc agctccaaca agctcatctc tgttttgtac acagttatca 900  
 cccccatctt gaacccttg atatactgcc tgaggaataa ggaatttaag aatgccttga 960  
 aaaaagcctt cggcttgacg agctgcgcc tagaggggag gctttctagt cttctggaac 1020  
 ttcattctca aatacacagc cagcctctct gaggaggcca tttgact 1067

<210> 206  
 <211> 343  
 <212> PRT  
 <213> Homo sapiens

<400> 206  
 Met Phe Cys Arg Pro Ala Ala Pro Lys His Arg Gly Met Ser Gly Glu  
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 Asn Val Thr Arg Val Gly Thr Phe Ile Leu Val Gly Phe Pro Thr Ala  
           20                                      25                                      30  
 Pro Gly Leu Gln Tyr Leu Leu Phe Leu Leu Phe Leu Leu Thr Tyr Leu  
           35                                      40                                      45  
 Phe Val Leu Val Glu Asn Leu Ala Ile Ile Leu Thr Val Trp Ser Ser  
           50                                      55                                      60  
 Thr Ser Leu His Arg Pro Met Tyr Tyr Phe Leu Ser Ser Met Ser Phe





<213> Homo sapiens

<400> 207

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ccagagctcc agctgcccct cttcctcctg ttcttaggaa tctatgtggt cacagtgggtg 120
ggcaacctgg gcatgaccac actgatttgg ctcagttctc acctgcacac ccctatgtac 180
tatttcctca gcagtctgtc cttcattgac ttctgccatt ccaactgtcat taccctaag 240
atgctggtga actttgtgac agagaagaac atcatctcct accctgaatg catgactcag 300
ctctacttct tcctcgtttt tgctattgca gagtgtcaca tgttggtgc aatggcgat 360
gaccgttaca tggccatctg tagccccttg ctgtacagtg tcatcatatc caataaggct 420
tgcttttctc tgatttttagg ggtgtatata ataggcctgg tttgtgcatc agttcataca 480
ggctgtatgt ttaggggttca attctgcaaa tttgatttga ttaaccatta tttctgtgat 540
cttcttcccc tcctaaagct ctcttgctct agtatctatg tcaacaaact acttattcta 600
tgtgttggtg catttaacat ccttggtcccc agcctgacca tcctttgtgc ttacatcttt 660
attattgcca gcacccctcca cattcgctcc actgagggca ggtccaaagc cttcagcact 720
tgtagctccc acatgtttggc ggttgtaatc ttttttggat ctgcagcatt catgtacttg 780
cagccatctt caatcagctc catggaccag gggaaagtat cctctgtgtt ttatactatt 840
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ctgaagaaaa tgctacagag aagaacatta ttgtaaaca 939
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<210> 208

<211> 311

<212> PRT

<213> Homo sapiens

<400> 208

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Met Ser Gly Glu Asn Asn Ser Ser Val Thr Glu Phe Ile Leu Ala Gly
  1              5              10             15

Leu Ser Glu Gln Pro Glu Leu Gln Leu Pro Leu Phe Leu Leu Phe Leu
      20              25              30

Gly Ile Tyr Val Val Thr Val Val Gly Asn Leu Gly Met Thr Thr Leu
      35              40              45

Ile Trp Leu Ser Ser His Leu His Thr Pro Met Tyr Tyr Phe Leu Ser
      50              55              60

Ser Leu Ser Phe Ile Asp Phe Cys His Ser Thr Val Ile Thr Pro Lys
      65              70              75              80

Met Leu Val Asn Phe Val Thr Glu Lys Asn Ile Ile Ser Tyr Pro Glu
      85              90              95

Cys Met Thr Gln Leu Tyr Phe Phe Leu Val Phe Ala Ile Ala Glu Cys
      100             105             110

His Met Leu Ala Ala Met Ala Tyr Asp Arg Tyr Met Ala Ile Cys Ser
      115             120             125

Pro Leu Leu Tyr Ser Val Ile Ile Ser Asn Lys Ala Cys Phe Ser Leu
      130             135             140

Ile Leu Gly Val Tyr Ile Ile Gly Leu Val Cys Ala Ser Val His Thr
      145             150             155             160
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Gly Cys Met Phe Arg Val Gln Phe Cys Lys Phe Asp Leu Ile Asn His  
 165 170 175  
 Tyr Phe Cys Asp Leu Leu Pro Leu Leu Lys Leu Ser Cys Ser Ser Ile  
 180 185 190  
 Tyr Val Asn Lys Leu Leu Ile Leu Cys Val Gly Ala Phe Asn Ile Leu  
 195 200 205  
 Val Pro Ser Leu Thr Ile Leu Cys Ser Tyr Ile Phe Ile Ile Ala Ser  
 210 215 220  
 Ile Leu His Ile Arg Ser Thr Glu Gly Arg Ser Lys Ala Phe Ser Thr  
 225 230 235 240  
 Cys Ser Ser His Met Leu Ala Val Val Ile Phe Phe Gly Ser Ala Ala  
 245 250 255  
 Phe Met Tyr Leu Gln Pro Ser Ser Ile Ser Ser Met Asp Gln Gly Lys  
 260 265 270  
 Val Ser Ser Val Phe Tyr Thr Ile Ile Val Pro Met Leu Asn Pro Leu  
 275 280 285  
 Ile Tyr Ser Leu Arg Asn Lys Asp Val His Val Ser Leu Lys Lys Met  
 290 295 300  
 Leu Gln Arg Arg Thr Leu Leu  
 305 310

<210> 209  
 <211> 1003  
 <212> DNA  
 <213> Homo sapiens

<400> 209  
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 aattttcctt tttgggagtg acagacattc aagaactgca gccttttctc ttcgttggtt 120  
 tccttaccat ctacttcac agtgtggctg ggaatggagc cattctgatg attgtcatct 180  
 ctgatcctag actccattcc cctatgtatt tcttcctggg aaacctgtcc tgcctggaca 240  
 tctgctactc cagcgtaaca ctgccaaaaa tgctgcagaa cttcctctct gcacacaaag 300  
 caatttcttt cttgggatgc ataagccaac tccatttctt ccacttcctg ggcagcacag 360  
 aggccatggt gttggcogtg atggcatttg accgctttgt ggctatttgc aagccacttc 420  
 gctacactgt cattatgaac cctcagctct gtaccagat ggccatcaca atctggatga 480  
 ttgggttttt ccatgccctg ctgcactccc taatgacctc tcgcttgaaac ttctgtggtt 540  
 ctaaccgtat ctatcacttc ttctgtgatg tgaagccatt gctaaagctg agccttaatc 600  
 agtggctgct cagtactgtc acagggacaa tcgccatggg ccccttcttt ctcacattac 660  
 tctcctattt ctacattatc acccatctct tcttcaagac tcattctttt agcatgctcc 720  
 gcaaagcact gtccacttgt gcttccactc tcatggtagt tattcttttg tatgcacctg 780  
 ttctcttcac ctatattcat catgcctcag ggacctccat ggaccaggac cggatcactg 840  
 ccatcatgta tactgtggtc actccagtac taaacctcact gatctacact ttgaggaaca 900  
 aggaagtga aggggccttt aatagagcaa tgaaaagggt gctttggcct aaagaaatct 960  
 tgaagaactc ttctgaagca taaataaaca attaaaaaga tga 1003

<210> 210

<211> 315  
 <212> PRT  
 <213> Homo sapiens

<400> 210

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Leu | Asn | Thr | Thr | Ser | Val | Thr | Glu | Phe | Leu | Leu | Leu | Gly | Val | Thr |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Asp | Ile | Gln | Glu | Leu | Gln | Pro | Phe | Leu | Phe | Val | Val | Phe | Leu | Thr | Ile |
|     |     | 20  |     |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Tyr | Phe | Ile | Ser | Val | Ala | Gly | Asn | Gly | Ala | Ile | Leu | Met | Ile | Val | Ile |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Ser | Asp | Pro | Arg | Leu | His | Ser | Pro | Met | Tyr | Phe | Phe | Leu | Gly | Asn | Leu |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Ser | Cys | Leu | Asp | Ile | Cys | Tyr | Ser | Ser | Val | Thr | Leu | Pro | Lys | Met | Leu |
|     | 65  |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Gln | Asn | Phe | Leu | Ser | Ala | His | Lys | Ala | Ile | Ser | Phe | Leu | Gly | Cys | Ile |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Ser | Gln | Leu | His | Phe | Phe | His | Phe | Leu | Gly | Ser | Thr | Glu | Ala | Met | Leu |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     |     | 110 |     |
| Leu | Ala | Val | Met | Ala | Phe | Asp | Arg | Phe | Val | Ala | Ile | Cys | Lys | Pro | Leu |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Arg | Tyr | Thr | Val | Ile | Met | Asn | Pro | Gln | Leu | Cys | Thr | Gln | Met | Ala | Ile |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Thr | Ile | Trp | Met | Ile | Gly | Phe | Phe | His | Ala | Leu | Leu | His | Ser | Leu | Met |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Thr | Ser | Arg | Leu | Asn | Phe | Cys | Gly | Ser | Asn | Arg | Ile | Tyr | His | Phe | Phe |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Cys | Asp | Val | Lys | Pro | Leu | Leu | Lys | Leu | Ser | Leu | Asn | Gln | Trp | Leu | Leu |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Ser | Thr | Val | Thr | Gly | Thr | Ile | Ala | Met | Gly | Pro | Phe | Phe | Leu | Thr | Leu |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Leu | Ser | Tyr | Phe | Tyr | Ile | Ile | Thr | His | Leu | Phe | Phe | Lys | Thr | His | Ser |
|     | 210 |     |     |     |     | 215 |     |     |     |     |     | 220 |     |     |     |
| Phe | Ser | Met | Leu | Arg | Lys | Ala | Leu | Ser | Thr | Cys | Ala | Ser | His | Phe | Met |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Val | Val | Ile | Leu | Leu | Tyr | Ala | Pro | Val | Leu | Phe | Thr | Tyr | Ile | His | His |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Ala | Ser | Gly | Thr | Ser | Met | Asp | Gln | Asp | Arg | Ile | Thr | Ala | Ile | Met | Tyr |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Thr | Val | Val | Thr | Pro | Val | Leu | Asn | Pro | Leu | Ile | Tyr | Thr | Leu | Arg | Asn |

275                      280                      285  
 Lys Glu Val Lys Gly Ala Phe Asn Arg Ala Met Lys Arg Trp Leu Trp  
 290                      295                      300  
 Pro Lys Glu Ile Leu Lys Asn Ser Ser Glu Ala  
 305                      310                      315  
  
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 <212> DNA  
 <213> Homo sapiens  
  
 <400> 211  
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 ctgcttgatg aactgatag gaaacctgtt catcatcatc ctgacgtacc tggactccca 180  
 tctccatact ccttctgatt tcttcctttc aaatctctca tttctggatc tctgctacac 240  
 caccagctct atccctcagt tgctgggtcag tctctgggggt gtggaaaaga ccatttctta 300  
 tgctgggttc atgggtcaac ttactttttt tctcacactg ggaaccacag agtgtgtcct 360  
 actgggtggt atgtcctatg accgttatgc agctgtgtgt agacctttgc attacactgt 420  
 cctcatgcac tctcgtttct gccacttggt ggctgtggct tcttgggtaa gtgggttttac 480  
 aaaccagca ctcatctcct ccttcacctt ctgggtacct ctgtgtggac accgccaat 540  
 agatcacttt ttctgtgaag ttccggcact tttaagatta tcatttgtca ataccctga 600  
 aaataaactg accctcatga tcacaagctc catttttgtt ctgctacttc tcaccctcat 660  
 tttcacttcc tatggtgcta ttgccaggc tgtactgagg atgcagtcaa ccactgggct 720  
 tcagaaagta tttggaacat gtggagctca tcatatgggt gtatctctct ttttcattcc 780  
 ggccatgtgc atgtatctcc agccaccatc aggggaattct caagatcaag gcaagtccat 840  
 tgctctcttt tatactgttg ttacacctag tcttaaccct ctaatctaca ccctcagaaa 900  
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 <210> 212  
 <211> 311  
 <212> PRT  
 <213> Homo sapiens  
  
 <400> 212  
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 Leu Val Gly Phe Ser Asn Trp Pro Tyr Leu Glu Val Val Leu Phe Val  
 20                      25                      30  
 Val Ile Leu Ile Phe Cys Leu Met Thr Leu Ile Gly Asn Leu Phe Ile  
 35                      40                      45  
 Ile Ile Leu Thr Tyr Leu Asp Ser His Leu His Thr Pro Leu Tyr Phe  
 50                      55                      60  
 Phe Leu Ser Asn Leu Ser Phe Leu Asp Leu Cys Tyr Thr Thr Ser Ser  
 65                      70                      75                      80  
 Ile Pro Gln Leu Leu Val Ser Leu Trp Gly Val Glu Lys Thr Ile Ser  
 85                      90                      95

Tyr Ala Gly Cys Met Val Gln Leu Tyr Phe Phe Leu Thr Leu Gly Thr  
 100 105 110  
 Thr Glu Cys Val Leu Leu Val Val Met Ser Tyr Asp Arg Tyr Ala Ala  
 115 120 125  
 Val Cys Arg Pro Leu His Tyr Thr Val Leu Met His Ser Arg Phe Cys  
 130 135 140  
 His Leu Leu Ala Val Ala Ser Trp Val Ser Gly Phe Thr Asn Pro Ala  
 145 150 155 160  
 Leu His Ser Ser Phe Thr Phe Trp Val Pro Leu Cys Gly His Arg Gln  
 165 170 175  
 Ile Asp His Phe Phe Cys Glu Val Pro Ala Leu Leu Arg Leu Ser Phe  
 180 185 190  
 Val Asn Thr Arg Glu Asn Lys Leu Thr Leu Met Ile Thr Ser Ser Ile  
 195 200 205  
 Phe Val Leu Leu Leu Leu Thr Leu Ile Phe Thr Ser Tyr Gly Ala Ile  
 210 215 220  
 Ala Gln Ala Val Leu Arg Met Gln Ser Thr Thr Gly Leu Gln Lys Val  
 225 230 235 240  
 Phe Gly Thr Cys Gly Ala His His Met Val Val Ser Leu Phe Phe Ile  
 245 250 255  
 Pro Ala Met Cys Met Tyr Leu Gln Pro Pro Ser Gly Asn Ser Gln Asp  
 260 265 270  
 Gln Gly Lys Phe Ile Ala Leu Phe Tyr Thr Val Val Thr Pro Ser Leu  
 275 280 285  
 Asn Pro Leu Ile Tyr Thr Leu Arg Asn Lys Asp Val Arg Gly Val Val  
 290 295 300  
 Lys Arg Leu Arg Gly Trp Glu  
 305 310

<210> 213

<211> 967

<212> DNA

<213> Homo sapiens

<400> 213

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 tattttttga ctcttgacagg aaatatgggtc atagttcttg tgtccttgaa ggatccaaaa 180  
 ctccacatcc ctatgtattt ctttctttcc aacctttcct tggtagacct ctgtttgacc 240  
 agcagctgtg ttccacagat gttgattaac ttctggggcc cagaaaagac catcagctac 300  
 attggctgtg ccattcaact ctatgttttt ttgtggcttg gggccacgga atatgtcctt 360  
 cttgttgtca tggctgtgga ttgttatgta gcagtgtgtc atccactgca aaataccatg 420  
 atcatgcacc caaaactttg tctgcagctg gctatcttgg catggggggac tggcttggcc 480

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cagtctctga tccagtcgcc tgccaccctc cggttaccct tctgctccca gcggtatggtg 540
gatgatgttg tttgtgaagt cccagctctg attcagctct ccagtactga tactacctac 600
agtgaaattc agatgtctat cgccagtgtt gtcctcctgg tgatgccctt gatcattatc 660
ctttcctctt ctggtgctat tgctaaggct gtgctgagaa ttaagtcaac tgcaggacag 720
aagaaagcat ttggcacctg catctctcac cttcttgtgg tttctctctt ttatggcact 780
gtcacagggtg tctaccttca accaaaaaat cactatcctc atgaatgggg caaatttctc 840
actcttttct acactgtagt aaccccaact cttaatcccc tcatctacac tctaaggaaac 900
aaggaggtaa agggagcact aataagattg gggaggagga cctgggattc ccagaataac 960
taacaag
967

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<210> 214  
 <211> 314  
 <212> PRT  
 <213> Homo sapiens

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<400> 214
Met Ile Ile Ile Cys Asn Asp Ser His Ser Asp Phe Ile Leu Leu Gly
  1             5             10             15

Phe Ser Asn Lys Pro His Leu Glu Lys Ile Leu Phe Trp Ile Ile Phe
      20             25             30

Ile Phe Tyr Phe Leu Thr Leu Ala Gly Asn Met Val Ile Val Leu Val
      35             40             45

Ser Leu Lys Asp Pro Lys Leu His Ile Pro Met Tyr Phe Phe Leu Ser
      50             55             60

Asn Leu Ser Leu Val Asp Leu Cys Leu Thr Ser Ser Cys Val Pro Gln
      65             70             75             80

Met Leu Ile Asn Phe Trp Gly Pro Glu Lys Thr Ile Ser Tyr Ile Gly
      85             90             95

Cys Ala Ile Gln Leu Tyr Val Phe Leu Trp Leu Gly Ala Thr Glu Tyr
      100            105            110

Val Leu Leu Val Val Met Ala Val Asp Cys Tyr Val Ala Val Cys His
      115            120            125

Pro Leu Gln Asn Thr Met Ile Met His Pro Lys Leu Cys Leu Gln Leu
      130            135            140

Ala Ile Leu Ala Trp Gly Thr Gly Leu Ala Gln Ser Leu Ile Gln Ser
      145            150            155            160

Pro Ala Thr Leu Arg Leu Pro Phe Cys Ser Gln Arg Met Val Asp Asp
      165            170            175

Val Val Cys Glu Val Pro Ala Leu Ile Gln Leu Ser Ser Thr Asp Thr
      180            185            190

Thr Tyr Ser Glu Ile Gln Met Ser Ile Ala Ser Val Val Leu Leu Val
      195            200            205

Met Pro Leu Ile Ile Ile Leu Ser Ser Ser Gly Ala Ile Ala Lys Ala

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| 210   | 215 | 220     |
|---|-----|---------|
| Val Leu Arg Ile Lys Ser Thr Ala Gly Gln Lys Lys Ala Phe Gly Thr |     |         |
| 225   | 230 | 235 240 |
| Cys Ile Ser His Leu Leu Val Val Ser Leu Phe Tyr Gly Thr Val Thr |     |         |
|   | 245 | 250 255 |
| Gly Val Tyr Leu Gln Pro Lys Asn His Tyr Pro His Glu Trp Gly Lys |     |         |
|   | 260 | 265 270 |
| Phe Leu Thr Leu Phe Tyr Thr Val Val Thr Pro Thr Leu Asn Pro Leu |     |         |
|   | 275 | 280 285 |
| Ile Tyr Thr Leu Arg Asn Lys Glu Val Lys Gly Ala Leu Ile Arg Leu |     |         |
|   | 290 | 295 300 |
| Gly Arg Arg Thr Trp Asp Ser Gln Asn Asn                         |     |         |
| 305   | 310 |         |

<210> 215  
 <211> 23  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence:  
 oligonucleotide primer

<400> 215  
 gaagggtttcc ctgggcggttc ctt 23

<210> 216  
 <211> 26  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence:  
 oligonucleotide primer

<400> 216  
 gtgaggtgca ggcaaaacca atgatt 26

<210> 217  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence:  
 oligonucleotide primer

<400> 217



gacccaaga gccttaatga ctctaga 27

<210> 218

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 218

ctgtccgctcg tccttcagag tcat 24

<210> 219

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 219

caaccaagag gcaagagg 18

<210> 220

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 220

ctccatgaga ctcaagtgaat aaga 24

<210> 221

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 221

ctgccttctg ccttatgcca 20

<210> 222

<211> 27

<212> DNA  
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 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
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 ttaagttcta gggtagatgt gcacaac 27  
  
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         oligonucleotide primer  
  
 <400> 223  
 gcctgggcct gctgactg 18  
  
 <210> 224  
 <211> 27  
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 <220>  
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         oligonucleotide primer  
  
 <400> 224  
 ccgcatcagc ctaggggtac tagagat. 27  
  
 <210> 225  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 225  
 ctgtgcactg ttggtgggaa tataaaa 27  
  
 <210> 226  
 <211> 28  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
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oligonucleotide primer

<400> 226  
tctggtggtt aagataaaac acaagtca 28

<210> 227  
<211> 19  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 227  
ttcggctgct gctgaccat 19

<210> 228  
<211> 27  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 228  
cctggtagcc tcaaagcttc ttagttc 27

<210> 229  
<211> 23  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 229  
atggctgccg agaactcctc ctc 23

<210> 230  
<211> 34  
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<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 230  
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<210> 231  
 <211> 22  
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 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
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         oligonucleotide primer  
  
 <400> 233  
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 <211> 27  
 <212> DNA  
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         oligonucleotide primer  
  
 <400> 234  
 cagctgcctg gctaactcct ataacac 27  
  
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<220>  
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     oligonucleotide primer  
  
 <400> 235  
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 <210> 236  
 <211> 24  
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     oligonucleotide primer  
  
 <400> 236  
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 <210> 237  
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 <212> DNA  
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     oligonucleotide primer  
  
 <400> 237  
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 <210> 238  
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     oligonucleotide primer  
  
 <400> 238  
 gtgtcacgtc gagtggttgg tg 22  
  
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 <211> 25  
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 <223> Description of Artificial Sequence:  
     oligonucleotide primer

|  |    |
|--|----|
| <p>&lt;400&gt; 239<br/> cacatagtct tggctccagt ttcgt</p>  | 25 |
|  |    |
| <p>&lt;210&gt; 240<br/> &lt;211&gt; 34<br/> &lt;212&gt; DNA<br/> &lt;213&gt; Artificial Sequence</p> |    |
| <p>&lt;220&gt;<br/> &lt;223&gt; Description of Artificial Sequence:<br/> oligonucleotide primer</p>  |    |
| <p>&lt;400&gt; 240<br/> ctaaagtttt attccaatca gtgttttttt ttcc</p>                                    | 34 |
|  |    |
| <p>&lt;210&gt; 241<br/> &lt;211&gt; 22<br/> &lt;212&gt; DNA<br/> &lt;213&gt; Artificial Sequence</p> |    |
| <p>&lt;220&gt;<br/> &lt;223&gt; Description of Artificial Sequence:<br/> oligonucleotide primer</p>  |    |
| <p>&lt;400&gt; 241<br/> gaatgatgcc cttttgccac aa</p>   | 22 |
|  |    |
| <p>&lt;210&gt; 242<br/> &lt;211&gt; 34<br/> &lt;212&gt; DNA<br/> &lt;213&gt; Artificial Sequence</p> |    |
| <p>&lt;220&gt;<br/> &lt;223&gt; Description of Artificial Sequence:<br/> oligonucleotide primer</p>  |    |
| <p>&lt;400&gt; 242<br/> ctatgaactc aattccaaaa ataatttaca cctg</p>                                    | 34 |
|  |    |
| <p>&lt;210&gt; 243<br/> &lt;211&gt; 21<br/> &lt;212&gt; DNA<br/> &lt;213&gt; Artificial Sequence</p> |    |
| <p>&lt;220&gt;<br/> &lt;223&gt; Description of Artificial Sequence:<br/> oligonucleotide primer</p>  |    |
| <p>&lt;400&gt; 243<br/> cctttttgtgg gttccatagt c</p>   | 21 |
|  |    |
| <p>&lt;210&gt; 244</p>   |    |

<211> 23  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 244  
 tttgtcccca agggccttcc agt 23  
  
 <210> 245  
 <211> 22  
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 <213> Artificial Sequence  
  
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         oligonucleotide primer  
  
 <400> 245  
 aaaagcaggt attcaacaag ca 22  
  
 <210> 246  
 <211> 22  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 246  
 gacaacaaac aagcaaacac aa 22  
  
 <210> 247  
 <211> 26  
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 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 247  
 accttcact tccttctggt cctgct 26  
  
 <210> 248  
 <211> 21  
 <212> DNA  
 <213> Artificial Sequence  
  
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<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 248  
gcaggagagg aggaagaaga g 21

<210> 249  
<211> 22  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 249  
gaggaggtgg aagaagatga tt 22

<210> 250  
<211> 26  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 250  
agaatctctt ccgcaagatc ctggct 26

<210> 251  
<211> 22  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 251  
catccaata tggagagtca aa 22

<210> 252  
<211> 22  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 252  
acctttctat gaggaggtgg aa 22



<210> 253  
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 <223> Description of Artificial Sequence:  
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 tgagaaccat gataagaatc tcttccg 27  
  
 <210> 254  
 <211> 19  
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 <400> 254  
 gtcaccagcc aggatcttg 19  
  
 <210> 255  
 <211> 22  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
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 agacgtcaaa cagggaaatc tt 22  
  
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         oligonucleotide primer  
  
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 <210> 257  
 <211> 21  
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<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 257  
tctgtaggtt cctcccatga g 21

<210> 258  
<211> 29  
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<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 258  
tccaggatat aagatcactc tgattgata 29

<210> 259  
<211> 35  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 259  
aggttcctcc catgagatat tcaataacaa gtcct 35

<210> 260  
<211> 26  
<212> DNA  
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<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 260  
aacgtttcct agtataggtg catctg 26

<210> 261  
<211> 28  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

|  |    |
|--|----|
| <400> 261                                  |    |
| tcagtgtatc aattgccata atttcttt             | 28 |
|  |    |
| <210> 262                                  |    |
| <211> 32                                   |    |
| <212> DNA                                  |    |
| <213> Artificial Sequence                  |    |
| <220>                                      |    |
| <223> Description of Artificial Sequence:  |    |
| oligonucleotide primer                     |    |
|  |    |
| <400> 262                                  |    |
| tttgctccaa atcttagtcc aaatccaatg aa        | 32 |
|  |    |
| <210> 263                                  |    |
| <211> 27                                   |    |
| <212> DNA                                  |    |
| <213> Artificial Sequence                  |    |
| <220>                                      |    |
| <223> Description of Artificial Sequence:  |    |
| oligonucleotide primer                     |    |
|  |    |
| <400> 263                                  |    |
| aaaaacatga ttatcatatg catttgc              | 27 |
|  |    |
| <210> 264                                  |    |
| <211> 24                                   |    |
| <212> DNA                                  |    |
| <213> Artificial Sequence                  |    |
| <220>                                      |    |
| <223> Description of Artificial Sequence:  |    |
| oligonucleotide primer                     |    |
|  |    |
| <400> 264                                  |    |
| tttacaagtg aaggcaattt ccaa                 | 24 |
|  |    |
| <210> 265                                  |    |
| <211> 39                                   |    |
| <212> DNA                                  |    |
| <213> Artificial Sequence                  |    |
| <220>                                      |    |
| <223> Description of Artificial Sequence:  |    |
| oligonucleotide primer                     |    |
|  |    |
| <400> 265                                  |    |
| agccataata aaatgataac gctggtactt ccatacaat | 39 |

<210> 266  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 266  
 gaggcagaac tggtttctca tga 23  
  
 <210> 267  
 <211> 22  
 <212> DNA  
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 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
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 caagccttcc ttcactgtta ag 22  
  
 <210> 268  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
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 ccccagcttc aaacatttct actcaa 26  
  
 <210> 269  
 <211> 22  
 <212> DNA  
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 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
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 gcctcaacag acagtttggt at 22  
  
 <210> 270  
 <211> 21  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 270  
 ccatttcgga cagtctcaat t 21  
  
 <210> 271  
 <211> 30  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 271  
 cctcaccttt aagaatagta gctctggaca 30  
  
 <210> 272  
 <211> 21  
 <212> DNA  
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 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 272  
 aggtgaagct ctgggtcttt t 21  
  
 <210> 273  
 <211> 22  
 <212> DNA  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
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 agccctgttg ttttattgat ga 22  
  
 <210> 274  
 <211> 26  
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         oligonucleotide primer  
  
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cctgagcccc aacaaggatt tcatat 26

<210> 275

<211> 19

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 275

cagacgaagg gtcaaattgg

19

<210> 276

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 276

gcctccaata tgaaacttca aa

22

<210> 277

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 277

tcctcagcta cgagtaagtt ctgtctca

28

<210> 278

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 278

cagaaccatc aggttgtgat tt

22

<210> 279

<211> 22

<212> DNA  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 279  
 cttgtgcctg tggttaacat ct 22  
  
  
 <210> 280  
 <211> 26  
 <212> DNA  
 <213> Artificial Sequence  
  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 280  
 tgatcactcc aggatattga cacgaa 26  
  
  
 <210> 281  
 <211> 22  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 281  
 accccagaac atgtgagtaa ga 22  
  
  
 <210> 282  
 <211> 22  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 282  
 ggtcttctac gtcagggaga at 22  
  
  
 <210> 283  
 <211> 26  
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 <213> Artificial Sequence  
  
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 <223> Description of Artificial Sequence:

oligonucleotide primer

<400> 283  
cagtttgcag tcgagacctt cttcga 26

<210> 284  
<211> 22  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 284  
gctgaatacg tcactgaaac ct 22

<210> 285  
<211> 22  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 285  
ggaactactg gctggagatt tt 22

<210> 286  
<211> 26  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 286  
ctgaacctgc tcattgttggc ctttct 26

<210> 287  
<211> 22  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 287  
aaacataaac gacaccaca ac 22



<210> 288  
 <211> 22  
 <212> DNA  
 <213> Artificial Sequence  
  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 288  
 tctacaccat cagctgtatg ca 22  
  
 <210> 289  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 289  
 caccaccctc acactcatct tcatca 26  
  
 <210> 290  
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         oligonucleotide primer  
  
 <400> 290  
 gcagtgcagc tgtcatatag aa 22  
  
 <210> 291  
 <211> 22  
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 <220>  
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         oligonucleotide primer  
  
 <400> 291  
 tggtcataac atcaatccca at 22  
  
 <210> 292  
 <211> 26  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence:  
     oligonucleotide primer

<400> 292  
 tggcttcatg gtgatattca cactct 26

<210> 293  
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 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence:  
     oligonucleotide primer

<400> 293  
 gaaagccaac accaaagaaa g 21

<210> 294  
 <211> 21  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence:  
     oligonucleotide primer

<400> 294  
 tgtgaatgtg gaggatgcta a 21

<210> 295  
 <211> 22  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence:  
     oligonucleotide primer

<400> 295  
 caaacaggga ctgagctgta ac 22

<210> 296  
 <211> 26  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence:  
     oligonucleotide primer

|   |    |
|---|----|
| <400> 296                                 |    |
| tacactgttc acgaccagtg tgccat              | 26 |
|   |    |
| <210> 297                                 |    |
| <211> 21                                  |    |
| <212> DNA                                 |    |
| <213> Artificial Sequence                 |    |
| <220>                                     |    |
| <223> Description of Artificial Sequence: |    |
| oligonucleotide primer                    |    |
|   |    |
| <400> 297                                 |    |
| gcataggtgc tgacttcaca a                   | 21 |
|   |    |
| <210> 298                                 |    |
| <211> 22                                  |    |
| <212> DNA                                 |    |
| <213> Artificial Sequence                 |    |
| <220>                                     |    |
| <223> Description of Artificial Sequence: |    |
| oligonucleotide primer                    |    |
|   |    |
| <400> 298                                 |    |
| ggtgctctgg aagttccagt at                  | 22 |
|   |    |
| <210> 299                                 |    |
| <211> 26                                  |    |
| <212> DNA                                 |    |
| <213> Artificial Sequence                 |    |
| <220>                                     |    |
| <223> Description of Artificial Sequence: |    |
| oligonucleotide primer                    |    |
|   |    |
| <400> 299                                 |    |
| accctcgaca ggtgttcaac ctccta              | 26 |
|   |    |
| <210> 300                                 |    |
| <211> 22                                  |    |
| <212> DNA                                 |    |
| <213> Artificial Sequence                 |    |
| <220>                                     |    |
| <223> Description of Artificial Sequence: |    |
| oligonucleotide primer                    |    |
|   |    |
| <400> 300                                 |    |
| cttgaataat cggagcccta tc                  | 22 |
|   |    |
| <210> 301                                 |    |

<211> 22  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 301  
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 <210> 302  
 <211> 26  
 <212> DNA  
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 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 302  
 ctacagccag agcgtcctct acctgg 26  
  
 <210> 303  
 <211> 22  
 <212> DNA  
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 <220>  
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         oligonucleotide primer  
  
 <400> 303  
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 <210> 304  
 <211> 22  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 304  
 cgctacagat gttcaagatc ct 22  
  
 <210> 305  
 <211> 26  
 <212> DNA  
 <213> Artificial Sequence  
  
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<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 305  
ctacagccag agcgtcctct acctgg 26

<210> 306  
<211> 22  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 306  
cctggaagtc actgaacttg ac 22

<210> 307  
<211> 22  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 307  
ctgaaagggt ccaagggtaca gt 22

<210> 308  
<211> 26  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 308  
cttcaaaggg tgcaagcccc aagtct 26

<210> 309  
<211> 22  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 309  
gtactgccag gcttaacacc tt 22

<210> 310  
 <211> 22  
 <212> DNA  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 310  
 gaaagggtcc aaggtacagt tc 22  
  
 <210> 311  
 <211> 26  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 311  
 cttcaaaggg tgcaagcccc aagtct 26  
  
 <210> 312  
 <211> 22  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 312  
 caggcttaac accttgtgaa ag 22  
  
 <210> 313  
 <211> 21  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 313  
 acaaccctac gtggatcatt g 21  
  
 <210> 314  
 <211> 30  
 <212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 314  
ccctattgat ggaacaacta agtttgtcca 30

<210> 315  
<211> 22  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 315  
tcgaaacagc tacaaaagga aa 22

<210> 316  
<211> 22  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 316  
ttcaacagga aggtgattct ca 22

<210> 317  
<211> 26  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 317  
attttcttct ggtcggccgt cacctt 26

<210> 318  
<211> 21  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

|  |    |
|--|----|
| <400> 318<br>aagtactgct ggggaatgaa g   | 21 |
|  |    |
| <210> 319<br><211> 22<br><212> DNA<br><213> Artificial Sequence              |    |
| <220><br><223> Description of Artificial Sequence:<br>oligonucleotide primer |    |
| <400> 319<br>gaacttcctc ccatttcttc ag  | 22 |
|  |    |
| <210> 320<br><211> 26<br><212> DNA<br><213> Artificial Sequence              |    |
| <220><br><223> Description of Artificial Sequence:<br>oligonucleotide primer |    |
| <400> 320<br>aaaccaggga gatcagcata agacaa                                    | 26 |
|  |    |
| <210> 321<br><211> 22<br><212> DNA<br><213> Artificial Sequence              |    |
| <220><br><223> Description of Artificial Sequence:<br>oligonucleotide primer |    |
| <400> 321<br>tagtggaac aaagggtag ac  | 22 |
|  |    |
| <210> 322<br><211> 22<br><212> DNA<br><213> Artificial Sequence              |    |
| <220><br><223> Description of Artificial Sequence:<br>oligonucleotide primer |    |
| <400> 322<br>tagttcaaga tgccactttc gt  | 22 |



<210> 323  
 <211> 26  
 <212> DNA  
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 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 323  
 actgcagact gctcactacc accgag 26  
  
 <210> 324  
 <211> 21  
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 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 324  
 cgtggtgctc aaattcatatc a 21  
  
 <210> 325  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 325  
 gagtcaccgt aaggctgtca 20  
  
 <210> 326  
 <211> 25  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 326  
 catcccttcg ccatcacagt gtttg 25  
  
 <210> 327  
 <211> 22  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 327  
 tctgtccagt acaggctgtc tt 22  
  
 <210> 328  
 <211> 21  
 <212> DNA  
 <213> Artificial Sequence  
  
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| <210> 332                                 |    |
| <211> 22                                  |    |
| <212> DNA                                 |    |
| <213> Artificial Sequence                 |    |
| <220>                                     |    |
| <223> Description of Artificial Sequence: |    |
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| gcccaattaca attgcacaat tt                 | 22 |
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| <210> 333                                 |    |
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| <213> Artificial Sequence                 |    |
| <220>                                     |    |
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| atgaacactc ctgccccttg gagtt               | 25 |
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| <210> 334                                 |    |
| <211> 22                                  |    |
| <212> DNA                                 |    |
| <213> Artificial Sequence                 |    |
| <220>                                     |    |
| <223> Description of Artificial Sequence: |    |
| oligonucleotide primer                    |    |
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| tctttcacgtg gatagccata ac                 | 22 |
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| <211> 22                                  |    |
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| oligonucleotide primer                    |    |
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| tgtcatacag tcccagacat tg                  | 22 |
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oligonucleotide primer

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<210> 341  
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oligonucleotide primer

<400> 341  
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<210> 342  
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<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 342  
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<210> 343  
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<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 343  
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<210> 344  
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<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 344  
ctacgatggc aaggattaca tc 22

<210> 345  
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         oligonucleotide primer  
  
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 <210> 347  
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 <210> 348  
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 <223> Description of Artificial Sequence:  
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<220>  
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     oligonucleotide primer

<400> 349  
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<210> 350  
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<220>  
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     oligonucleotide primer

<400> 350  
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<210> 351  
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<220>  
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     oligonucleotide primer

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<210> 352  
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     oligonucleotide primer

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<210> 353  
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<220>  
 <223> Description of Artificial Sequence:  
     oligonucleotide primer

<400> 353  
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<210> 354  
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<212> DNA  
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<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 354  
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<210> 355  
<211> 20  
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<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 355  
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<210> 356  
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<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 356  
aaaagtttcg gtctggctta tc 22

<210> 357  
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<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 357  
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<210> 358



<211> 22  
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         oligonucleotide primer  
  
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         oligonucleotide primer  
  
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 <210> 362  
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<223> Description of Artificial Sequence:  
 oligonucleotide primer

<400> 362  
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<210> 363  
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 oligonucleotide primer

<400> 363  
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<210> 364  
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 oligonucleotide primer

<400> 364  
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<210> 365  
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<400> 365  
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<210> 366  
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 oligonucleotide primer

<400> 366  
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<210> 367  
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         oligonucleotide primer  
  
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 <210> 369  
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 <210> 370  
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 <210> 371  
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<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 371  
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<210> 372  
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<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 372  
cacatgtcat gatgacactg gcacaa 26

<210> 373  
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<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 373  
cagacttctc ccagtagttg ga 22

<210> 374  
<211> 22  
<212> DNA  
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<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 374  
agcaacgggt cacaattcta ta 22

<210> 375  
<211> 28  
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<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

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| <400> 375<br>tcacactgca agcaactcct tatctaga                                  | 28 |
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| <210> 376<br><211> 22<br><212> DNA<br><213> Artificial Sequence              |    |
| <220><br><223> Description of Artificial Sequence:<br>oligonucleotide primer |    |
| <400> 376<br>atacccaaaa gccacaaatt tt  | 22 |
|  |    |
| <210> 377<br><211> 22<br><212> DNA<br><213> Artificial Sequence              |    |
| <220><br><223> Description of Artificial Sequence:<br>oligonucleotide primer |    |
| <400> 377<br>gtgagactgg caagaagatc ac  | 22 |
|  |    |
| <210> 378<br><211> 26<br><212> DNA<br><213> Artificial Sequence              |    |
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| <400> 378<br>ctgccaactg cggacaactc taatca                                    | 26 |
|  |    |
| <210> 379<br><211> 22<br><212> DNA<br><213> Artificial Sequence              |    |
| <220><br><223> Description of Artificial Sequence:<br>oligonucleotide primer |    |
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 <223> Description of Artificial Sequence:  
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         oligonucleotide primer  
  
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 <210> 383  
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         oligonucleotide primer  
  
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         oligonucleotide primer  
  
 <400> 385  
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 <210> 386  
 <211> 22  
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         oligonucleotide primer  
  
 <400> 386  
 caaccctggt caaataattc aa 22  
  
 <210> 387  
 <211> 26  
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 <400> 387  
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 <210> 388  
 <211> 22  
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         oligonucleotide primer  
  
 <400> 388

ttttcactcc atgagcatga at 22

<210> 389  
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<212> DNA  
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<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 389  
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<210> 390  
<211> 24  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 390  
caattccatg gccaaaggact cctg 24

<210> 391  
<211> 22  
<212> DNA  
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<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 391  
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<210> 392  
<211> 22  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 392  
cagacctatg caacctctgg ta 22

<210> 393  
<211> 25



<212> DNA  
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 <223> Description of Artificial Sequence:  
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 <210> 394  
 <211> 20  
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         oligonucleotide primer  
  
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 <210> 395  
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         oligonucleotide primer  
  
 <400> 395  
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 <210> 396  
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         oligonucleotide primer  
  
 <400> 396  
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 <210> 397  
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oligonucleotide primer

<400> 397  
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<210> 398  
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<212> DNA  
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oligonucleotide primer

<400> 398  
gcaacaaatt cctgaagatc ag 22

<210> 399  
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<212> DNA  
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<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 399  
cctcagctga actcaaaagc catcaa 26

<210> 400  
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<212> DNA  
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<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 400  
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<210> 401  
<211> 22  
<212> DNA  
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<220>  
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oligonucleotide primer

<400> 401  
agcatgtaca tgtttccttt gc 22

<210> 402  
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 <210> 403  
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         oligonucleotide primer  
  
 <400> 403  
 tgcaacattt cacttccata ca 22  
  
 <210> 404  
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         oligonucleotide primer  
  
 <400> 404  
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 <210> 405  
 <211> 26  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 405  
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 <210> 406  
 <211> 22  
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<220>  
 <223> Description of Artificial Sequence:  
     oligonucleotide primer

<400> 406  
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<210> 407  
 <211> 22  
 <212> DNA  
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<220>  
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     oligonucleotide primer

<400> 407  
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<210> 408  
 <211> 25  
 <212> DNA  
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<220>  
 <223> Description of Artificial Sequence:  
     oligonucleotide primer

<400> 408  
 caccatcggc tttggacaga tcaag 25

<210> 409  
 <211> 21  
 <212> DNA  
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<220>  
 <223> Description of Artificial Sequence:  
     oligonucleotide primer

<400> 409  
 gttctgtagt cccagcaggt t 21

<210> 410  
 <211> 21  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence:  
     oligonucleotide primer

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| <p>&lt;400&gt; 410<br/> gttcctgctg gacttcattt c</p>  | 21 |
| <p>&lt;210&gt; 411<br/> &lt;211&gt; 26<br/> &lt;212&gt; DNA<br/> &lt;213&gt; Artificial Sequence</p> |    |
| <p>&lt;220&gt;<br/> &lt;223&gt; Description of Artificial Sequence:<br/> oligonucleotide primer</p>  |    |
| <p>&lt;400&gt; 411<br/> accccgatcat taaaggcttc acctct</p>  | 26 |
| <p>&lt;210&gt; 412<br/> &lt;211&gt; 22<br/> &lt;212&gt; DNA<br/> &lt;213&gt; Artificial Sequence</p> |    |
| <p>&lt;220&gt;<br/> &lt;223&gt; Description of Artificial Sequence:<br/> oligonucleotide primer</p>  |    |
| <p>&lt;400&gt; 412<br/> caggttcttg atctgtccaa ag</p>   | 22 |
| <p>&lt;210&gt; 413<br/> &lt;211&gt; 21<br/> &lt;212&gt; DNA<br/> &lt;213&gt; Artificial Sequence</p> |    |
| <p>&lt;220&gt;<br/> &lt;223&gt; Description of Artificial Sequence:<br/> oligonucleotide primer</p>  |    |
| <p>&lt;400&gt; 413<br/> gttcctgctg gacttcattt c</p>  | 21 |
| <p>&lt;210&gt; 414<br/> &lt;211&gt; 26<br/> &lt;212&gt; DNA<br/> &lt;213&gt; Artificial Sequence</p> |    |
| <p>&lt;220&gt;<br/> &lt;223&gt; Description of Artificial Sequence:<br/> oligonucleotide primer</p>  |    |
| <p>&lt;400&gt; 414<br/> accccgatcat taaaggcttc acctct</p>  | 26 |
| <p>&lt;210&gt; 415</p>   |    |

<211> 22  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 415  
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 <210> 416  
 <211> 22  
 <212> DNA  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
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 <400> 417  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 418  
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 <210> 419  
 <211> 22  
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<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 419  
tggcaccttc taatgttcaa at 22

<210> 420  
<211> 26  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 420  
tttccaggta ctcagatggt accctg 26

<210> 421  
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<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 421  
cgcgtgttaa atacgtttga ag 22

<210> 422  
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<212> DNA  
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<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 422  
ttctacatgg ctctgaagt ct 22

<210> 423  
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<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 423  
actacacagc caaggcggac atcttt 26

<210> 424  
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 gaccagcttt gactatgaat gc 22  
  
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 ggagttgaac gtatccactg aa 22  
  
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<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 428  
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<210> 429  
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<212> DNA  
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<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 429  
tcaaagatct attcctacat gagcccga 28

<210> 430  
<211> 20  
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<213> Artificial Sequence

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<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 430  
aaacgcattc cagagcattt 20

<210> 431  
<211> 22  
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<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 431  
accagcctgt caactactcc tt 22

<210> 432  
<211> 26  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

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| <p>&lt;400&gt; 432<br/>ccactccacc tacttggtga accagg</p>   | 26 |
| <p>&lt;210&gt; 433<br/>&lt;211&gt; 22<br/>&lt;212&gt; DNA<br/>&lt;213&gt; Artificial Sequence</p> |    |
| <p>&lt;220&gt;<br/>&lt;223&gt; Description of Artificial Sequence:<br/>oligonucleotide primer</p> |    |
| <p>&lt;400&gt; 433<br/>ggaaattgac actctggtca aa</p>   | 22 |
| <p>&lt;210&gt; 434<br/>&lt;211&gt; 21<br/>&lt;212&gt; DNA<br/>&lt;213&gt; Artificial Sequence</p> |    |
| <p>&lt;220&gt;<br/>&lt;223&gt; Description of Artificial Sequence:<br/>oligonucleotide primer</p> |    |
| <p>&lt;400&gt; 434<br/>catcgagacc cagagtaaag c</p>  | 21 |
| <p>&lt;210&gt; 435<br/>&lt;211&gt; 26<br/>&lt;212&gt; DNA<br/>&lt;213&gt; Artificial Sequence</p> |    |
| <p>&lt;220&gt;<br/>&lt;223&gt; Description of Artificial Sequence:<br/>oligonucleotide primer</p> |    |
| <p>&lt;400&gt; 435<br/>catgacaatg ctcaccattg aacagt</p>   | 26 |
| <p>&lt;210&gt; 436<br/>&lt;211&gt; 22<br/>&lt;212&gt; DNA<br/>&lt;213&gt; Artificial Sequence</p> |    |
| <p>&lt;220&gt;<br/>&lt;223&gt; Description of Artificial Sequence:<br/>oligonucleotide primer</p> |    |
| <p>&lt;400&gt; 436<br/>tttcattttc tgaatggcaa ac</p>   | 22 |

<210> 437  
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         oligonucleotide primer  
  
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 tctcaggaag tggatgaagga 20  
  
 <210> 438  
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 <212> DNA  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
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 caattctcca aggatacatt ggaaaa 26  
  
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         oligonucleotide primer  
  
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         oligonucleotide primer  
  
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         oligonucleotide primer  
  
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         oligonucleotide primer  
  
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         oligonucleotide primer  
  
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 <210> 444  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
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         oligonucleotide primer  
  
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cccacctatg agtgagaaca tg 22

<210> 446  
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<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 446  
tcacaaggac agaaaaccaa ac 22

<210> 447  
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<212> DNA  
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<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 447  
ccacatgttc tctctcatag gtggga 26

<210> 448  
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<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 448  
gtgtccatgt gttctcgttg tt 22

<210> 449  
<211> 22  
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<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 449  
gccatcccat tactgggtat at 22

<210> 450  
<211> 26

<212> DNA  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
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 <210> 451  
 <211> 22  
 <212> DNA  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
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 tagtgccgca ataaacatac gt 22  
  
  
 <210> 452  
 <211> 19  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
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 cctcgtctcg agacaagga 19  
  
  
 <210> 453  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
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 accatcctcg acacactccg ggag 24  
  
  
 <210> 454  
 <211> 20  
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 <223> Description of Artificial Sequence:

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| oligonucleotide primer                    |    |
| <400> 454                                 |    |
| cggtccttag tgggtttgac                     | 20 |
|   |    |
| <210> 455                                 |    |
| <211> 20                                  |    |
| <212> DNA                                 |    |
| <213> Artificial Sequence                 |    |
| <220>                                     |    |
| <223> Description of Artificial Sequence: |    |
| oligonucleotide primer                    |    |
| <400> 455                                 |    |
| ccggtacacc aatgatctgt                     | 20 |
|   |    |
| <210> 456                                 |    |
| <211> 23                                  |    |
| <212> DNA                                 |    |
| <213> Artificial Sequence                 |    |
| <220>                                     |    |
| <223> Description of Artificial Sequence: |    |
| oligonucleotide primer                    |    |
| <400> 456                                 |    |
| cgaacatgct tctgctgcgt cct                 | 23 |
|   |    |
| <210> 457                                 |    |
| <211> 19                                  |    |
| <212> DNA                                 |    |
| <213> Artificial Sequence                 |    |
| <220>                                     |    |
| <223> Description of Artificial Sequence: |    |
| oligonucleotide primer                    |    |
| <400> 457                                 |    |
| tgacgacttt ccacaccaa                      | 19 |
|   |    |
| <210> 458                                 |    |
| <211> 22                                  |    |
| <212> DNA                                 |    |
| <213> Artificial Sequence                 |    |
| <220>                                     |    |
| <223> Description of Artificial Sequence: |    |
| oligonucleotide primer                    |    |
| <400> 458                                 |    |
| ttgccatcta ttccgagtac tg                  | 22 |

<210> 459  
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         oligonucleotide primer  
  
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 <210> 461  
 <211> 21  
 <212> DNA  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
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 gtgcaagagg acaaggagat g 21  
  
 <210> 462  
 <211> 26  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 462  
 ttcagaaaac cagaagaaac ttgcca 26  
  
 <210> 463  
 <211> 21  
 <212> DNA  
 <213> Artificial Sequence



<220>  
 <223> Description of Artificial Sequence:  
     oligonucleotide primer  
  
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 cctgcctttt gagcatttaa c 21  
  
 <210> 464  
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 <220>  
 <223> Description of Artificial Sequence:  
     oligonucleotide primer  
  
 <400> 464  
 ggaataacctg gtcaggaaga ag 22  
  
 <210> 465  
 <211> 26  
 <212> DNA  
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 <220>  
 <223> Description of Artificial Sequence:  
     oligonucleotide primer  
  
 <400> 465  
 cacatctata tccccaagaa cgtca 26  
  
 <210> 466  
 <211> 22  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence:  
     oligonucleotide primer  
  
 <400> 466  
 ttggcattga tacagctgaa gt 22  
  
 <210> 467  
 <211> 22  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence:  
     oligonucleotide primer

|  |    |
|--|----|
| <p>&lt;400&gt; 467<br/> tgtctcaagg ctttgagttc tt</p>   | 22 |
| <p>&lt;210&gt; 468<br/> &lt;211&gt; 23<br/> &lt;212&gt; DNA<br/> &lt;213&gt; Artificial Sequence</p> |    |
| <p>&lt;220&gt;<br/> &lt;223&gt; Description of Artificial Sequence:<br/> oligonucleotide primer</p>  |    |
| <p>&lt;400&gt; 468<br/> ctgcagccag tctctgtcca aaa</p>  | 23 |
| <p>&lt;210&gt; 469<br/> &lt;211&gt; 22<br/> &lt;212&gt; DNA<br/> &lt;213&gt; Artificial Sequence</p> |    |
| <p>&lt;220&gt;<br/> &lt;223&gt; Description of Artificial Sequence:<br/> oligonucleotide primer</p>  |    |
| <p>&lt;400&gt; 469<br/> tccccactcc ttcatacataa at</p>  | 22 |
| <p>&lt;210&gt; 470<br/> &lt;211&gt; 21<br/> &lt;212&gt; DNA<br/> &lt;213&gt; Artificial Sequence</p> |    |
| <p>&lt;220&gt;<br/> &lt;223&gt; Description of Artificial Sequence:<br/> oligonucleotide primer</p>  |    |
| <p>&lt;400&gt; 470<br/> gacgttcaac aatgacatgc t</p>  | 21 |
| <p>&lt;210&gt; 471<br/> &lt;211&gt; 25<br/> &lt;212&gt; DNA<br/> &lt;213&gt; Artificial Sequence</p> |    |
| <p>&lt;220&gt;<br/> &lt;223&gt; Description of Artificial Sequence:<br/> oligonucleotide primer</p>  |    |
| <p>&lt;400&gt; 471<br/> cttcatacagc agcagctgca ttgct</p>   | 25 |
| <p>&lt;210&gt; 472</p>   |    |

<211> 22  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 472  
 agcaggaggt gaggatgtag ac 22  
  
 <210> 473  
 <211> 22  
 <212> DNA  
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         oligonucleotide primer  
  
 <400> 473  
 ccctcagagg actggtttac tt 22  
  
 <210> 474  
 <211> 23  
 <212> DNA  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 474  
 cacctctgcc tgccacacct cag 23  
  
 <210> 475  
 <211> 22  
 <212> DNA  
 <213> Artificial Sequence  
  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 475  
 ctacatgcag tggagcaagt ct 22  
  
 <210> 476  
 <211> 21  
 <212> DNA  
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<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 476  
gaactgttcc ttgtggtttc c 21

<210> 477  
<211> 24  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 477  
accacaggca tcagcagtcc catt 24

<210> 478  
<211> 21  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 478  
acactttgcc tcaggtgact t 21

<210> 479  
<211> 22  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 479  
gtcaggagaa ctgttccttg tg 22

<210> 480  
<211> 23  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 480  
accacaggca tcagcagtcc cat 23

<210> 481  
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 <212> DNA  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
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 <210> 482  
 <211> 21  
 <212> DNA  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 482  
 ttggagcctt tgctcctatg t 21  
  
 <210> 483  
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 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 483  
 aggggagacc atccccaagt tacaaa 26  
  
 <210> 484  
 <211> 21  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 484  
 aagatgccca gaaaagctgt a 21  
  
 <210> 485  
 <211> 22  
 <212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 485  
ccatctttctg tgggacagtt ac 22

<210> 486  
<211> 28  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 486  
catgtatata cagccaggaa acagtcca 28

<210> 487  
<211> 22  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 487  
agaagtttgc cctcattctg at 22

<210> 488  
<211> 22  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 488  
gagttgcatt gtggttggtgt tg 22

<210> 489  
<211> 27  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

|   |    |
|---|----|
| <400> 489                                 |    |
| tcatttttcct tgcatacatt cttctca            | 27 |
|   |    |
| <210> 490                                 |    |
| <211> 22                                  |    |
| <212> DNA                                 |    |
| <213> Artificial Sequence                 |    |
| <220>                                     |    |
| <223> Description of Artificial Sequence: |    |
| oligonucleotide primer                    |    |
|   |    |
| <400> 490                                 |    |
| caatgaagcc atatgacaca ag                  | 22 |
|   |    |
| <210> 491                                 |    |
| <211> 22                                  |    |
| <212> DNA                                 |    |
| <213> Artificial Sequence                 |    |
| <220>                                     |    |
| <223> Description of Artificial Sequence: |    |
| oligonucleotide primer                    |    |
|   |    |
| <400> 491                                 |    |
| tttgtggctg ttttgatatc ct                  | 22 |
|   |    |
| <210> 492                                 |    |
| <211> 26                                  |    |
| <212> DNA                                 |    |
| <213> Artificial Sequence                 |    |
| <220>                                     |    |
| <223> Description of Artificial Sequence: |    |
| oligonucleotide primer                    |    |
|   |    |
| <400> 492                                 |    |
| tctccttacc cttgtgggaa atacag              | 26 |
|   |    |
| <210> 493                                 |    |
| <211> 22                                  |    |
| <212> DNA                                 |    |
| <213> Artificial Sequence                 |    |
| <220>                                     |    |
| <223> Description of Artificial Sequence: |    |
| oligonucleotide primer                    |    |
|   |    |
| <400> 493                                 |    |
| gggtctacag agcagatcag aa                  | 22 |

<210> 494  
 <211> 22  
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 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 494  
 tggccatgta ttgtgtgact at 22  
  
 <210> 495  
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 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 495  
 aggaaacacc ctctattcttc ttctga 26  
  
 <210> 496  
 <211> 22  
 <212> DNA  
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 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 496  
 tatgaagcct gttgtccagt ct 22  
  
 <210> 497  
 <211> 22  
 <212> DNA  
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         oligonucleotide primer  
  
 <400> 497  
 gaggtgcttt caacaaagga at 22  
  
 <210> 498  
 <211> 28  
 <212> DNA  
 <213> Artificial Sequence



<220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 498  
 tcggttactc ccttactgaa tcccttca 28  
  
 <210> 499  
 <211> 22  
 <212> DNA  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 499  
 gcttggtttca cttgctgatt tc 22  
  
 <210> 500  
 <211> 22  
 <212> DNA  
 <213> Artificial Sequence  
  
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 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 500  
 gaggtgcttt caacaaagga at 22  
  
 <210> 501  
 <211> 28  
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 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence:  
         oligonucleotide primer  
  
 <400> 501  
 tcggttactc ccttactgaa tcccttca 28  
  
 <210> 502  
 <211> 22  
 <212> DNA  
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 <220>  
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         oligonucleotide primer  
  
 <400> 502

gcttgtttca cttgctgatt tc 22

<210> 503  
<211> 22  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 503  
tacactgttg tcacgccaat aa 22

<210> 504  
<211> 26  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 504  
ccctttgatt tactgcctga ggaaca 26

<210> 505  
<211> 22  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 505  
ttttcaaggc gtccttaaatt tc 22

<210> 506  
<211> 22  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 506  
attgatttggt tttggctact tg 22

<210> 507  
<211> 30

<212> DNA  
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         oligonucleotide primer  
  
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 aactctacat ttaatccaat ggtttatgca 30  
  
 <210> 508  
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oligonucleotide primer

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oligonucleotide primer

<400> 537  
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oligonucleotide primer

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22

<210> 543

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:  
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<400> 543

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27

<210> 544

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 544

ccctttacct ccttggtcct ta

22

<210> 545

<211> 25

<212> DNA

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<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 545

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25

<210> 546

<211> 29

<212> DNA

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<223> Description of Artificial Sequence:  
oligonucleotide primer

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| <p>&lt;210&gt; 547<br/> &lt;211&gt; 25<br/> &lt;212&gt; DNA<br/> &lt;213&gt; Artificial Sequence</p> |    |
| <p>&lt;220&gt;<br/> &lt;223&gt; Description of Artificial Sequence:<br/> oligonucleotide primer</p>  |    |
| <p>&lt;400&gt; 547<br/> ttagcaatag caccagaaga ggaaa</p>  | 25 |
| <p>&lt;210&gt; 548<br/> &lt;211&gt; 28<br/> &lt;212&gt; DNA<br/> &lt;213&gt; Artificial Sequence</p> |    |
| <p>&lt;220&gt;<br/> &lt;223&gt; Description of Artificial Sequence:<br/> oligonucleotide primer</p>  |    |
| <p>&lt;400&gt; 548<br/> ccccatgccc cgggcagtgt ccgggtcc</p>   | 28 |
| <p>&lt;210&gt; 549<br/> &lt;211&gt; 30<br/> &lt;212&gt; DNA<br/> &lt;213&gt; Artificial Sequence</p> |    |
| <p>&lt;220&gt;<br/> &lt;223&gt; Description of Artificial Sequence:<br/> oligonucleotide primer</p>  |    |
| <p>&lt;400&gt; 549<br/> gctgggctcg ccgatcagat cctgcatgac</p>   | 30 |
| <p>&lt;210&gt; 550<br/> &lt;211&gt; 19<br/> &lt;212&gt; DNA<br/> &lt;213&gt; Artificial Sequence</p> |    |
| <p>&lt;220&gt;<br/> &lt;223&gt; Description of Artificial Sequence:<br/> oligonucleotide primer</p>  |    |
| <p>&lt;400&gt; 550<br/> cctggagcct gagacagcg</p>   | 19 |

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 <210> 559  
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 <400> 559

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| tggtattctg gcagttcacg c   | 21 |
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| <400> 560   |    |
| gaattcccct gccgcctgct gtcctcacc                                     | 29 |
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| <210> 561   |    |
| <211> 36  |    |
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| <223> Description of Artificial Sequence:<br>oligonucleotide primer |    |
| <400> 561   |    |
| ctcgaggcac tgctggccgc ccagcggact cccgtg                             | 36 |
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| <210> 562   |    |
| <211> 23  |    |
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| <400> 562   |    |
| ctctgagaat gactgtcgga tca   | 23 |
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| <400> 563   |    |
| tacctcctgc ctggactcta agg   | 23 |
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 <210> 566  
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 <210> 568  
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oligonucleotide primer

<400> 568  
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<210> 569  
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<220>  
<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 569  
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<210> 570  
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oligonucleotide primer

<400> 570  
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<210> 571  
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oligonucleotide primer

<400> 571  
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<210> 572  
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oligonucleotide primer

<400> 572  
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<210> 573  
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 <400> 574  
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         oligonucleotide primer  
  
 <400> 575  
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 <400> 576  
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 <223> Description of Artificial Sequence:  
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<400> 581  
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<210> 582  
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<400> 582  
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<210> 583  
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<400> 583  
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<210> 584  
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<400> 584  
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<210> 585  
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 <212> DNA  
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<400> 585  
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<210> 586

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<210> 587  
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<210> 588  
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<210> 589  
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<210> 590  
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<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 590

aaatcttgga tcgctatggt cagga

25

<210> 591

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<223> Description of Artificial Sequence:  
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<400> 591

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27

<210> 592

<211> 25

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<223> Description of Artificial Sequence:  
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<400> 592

ataggtgtac ccttgactgc atccg

25

<210> 593

<211> 25

<212> DNA

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<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 593

cctttggtgg caagttcact tactg

25

<210> 594

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:  
oligonucleotide primer

<400> 594

cagaagtaaa cattcttgca tcttcag

27

<210> 595  
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<210> 600  
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<210> 601  
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     oligonucleotide primer



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| <p>&lt;400&gt; 604<br/> gcgggtcaat cagaagctca aac</p>  | 23 |
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| <p>&lt;400&gt; 605<br/> cttgagtagc cggatgtcca ccag</p>   | 24 |
| <p>&lt;210&gt; 606<br/> &lt;211&gt; 27<br/> &lt;212&gt; DNA<br/> &lt;213&gt; Artificial Sequence</p> |    |
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| <p>&lt;400&gt; 606<br/> agggagaggt agctgggcag gtactga</p>  | 27 |
| <p>&lt;210&gt; 607<br/> &lt;211&gt; 25<br/> &lt;212&gt; DNA<br/> &lt;213&gt; Artificial Sequence</p> |    |
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<210> 627  
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<210> 629  
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oligonucleotide primer

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<210> 630  
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     oligonucleotide primer



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| <p>&lt;400&gt; 638<br/> atgaccctgc agcccttttc tttta</p>  | 25 |
| <p>&lt;210&gt; 639<br/> &lt;211&gt; 27<br/> &lt;212&gt; DNA<br/> &lt;213&gt; Artificial Sequence</p> |    |
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| <p>&lt;400&gt; 639<br/> aggatttcaa gatgaaaaag tccagca</p>  | 27 |
| <p>&lt;210&gt; 640<br/> &lt;211&gt; 27<br/> &lt;212&gt; DNA<br/> &lt;213&gt; Artificial Sequence</p> |    |
| <p>&lt;220&gt;<br/> &lt;223&gt; Description of Artificial Sequence:<br/> oligonucleotide primer</p>  |    |
| <p>&lt;400&gt; 640<br/> tgataactctg gtggaccaat acacagc</p>   | 27 |
| <p>&lt;210&gt; 641<br/> &lt;211&gt; 24<br/> &lt;212&gt; DNA<br/> &lt;213&gt; Artificial Sequence</p> |    |
| <p>&lt;220&gt;<br/> &lt;223&gt; Description of Artificial Sequence:<br/> oligonucleotide primer</p>  |    |
| <p>&lt;400&gt; 641<br/> catcgatgag aatggcctta cagc</p>   | 24 |
| <p>&lt;210&gt; 642<br/> &lt;211&gt; 27<br/> &lt;212&gt; DNA<br/> &lt;213&gt; Artificial Sequence</p> |    |
| <p>&lt;220&gt;<br/> &lt;223&gt; Description of Artificial Sequence:<br/> oligonucleotide primer</p>  |    |
| <p>&lt;400&gt; 642<br/> tgaaccactc gtgcagtgac tggtaag</p>  | 27 |
| <p>&lt;210&gt; 643</p>   |    |

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<223> Description of Artificial Sequence:  
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<210> 648  
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<400> 648  
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<210> 649  
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<210> 650  
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24